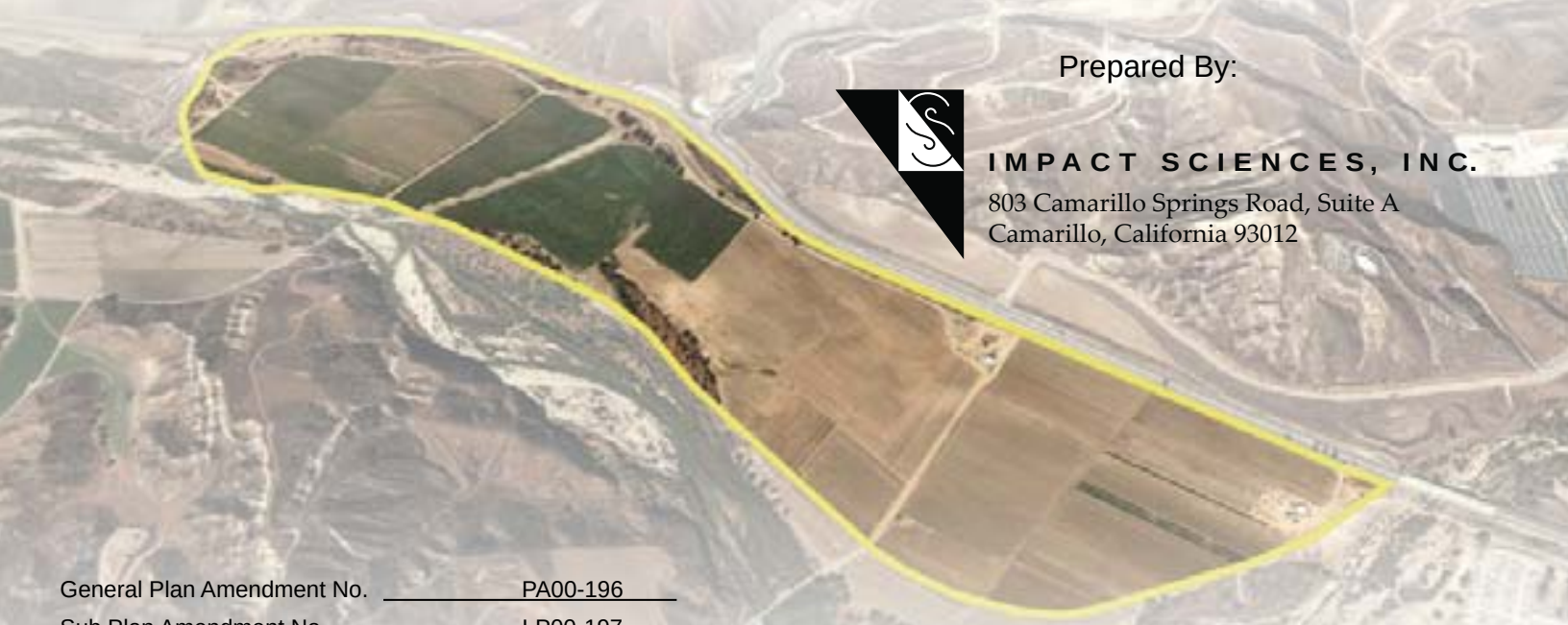
County of Los Angeles

Final Environmental Impact Report

SCH No. 2004021002

Volume III of V - Appendices

LANDMARK VILLAGE



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Sub Plan Amendment No.	LP00-197
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NEWHALL RANCH
Newhall Ranch Company

November 2007

FINAL
ENVIRONMENTAL IMPACT REPORT

for
LANDMARK VILLAGE

SCH No. 2004021002

Volume III of V
Appendices

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Newhall Ranch Fiscal Impact Analysis, September 2006

Appendix E Cultural/Paleontological Resources
Letter from W&S Consultants, February 15, 2007

Appendix F Land Use
Sustainability Summary
Affordable Housing Program

Appendix G Water Quality
Letter from California Regional Water Quality Control Board, September 11, 2007
Waste Discharge Requirements for the Newhall Ranch Sanitation District (Newhall Ranch Water Reclamation Plant), Discharge to the Santa Clara River, Order No. R4-2007-0046, NPDES No. CA0064556

Appendix H Staff Reports
January 31, 2007 Staff Report
February 22, 2007 Staff Report

APPENDIX A

Biological Resources

Oak Tree Relocation Report
Richard Johnson, May 2003

Richard Johnson & Associates
Environmental Horticulture

801 Glenneyre Street, Suite D, Laguna Beach, CA 92651
P.O. Box 127, Laguna Beach, CA 92652
Phone: (949) 497 - 4248 Fax: (949) 497 - 6440

OAK TREE SURVEY
PRESERVED AND RELOACATED OAKS
Newhall Land and Farming/Valencia Company Projects

Prepared for:

Corey Harpole
Valencia Company
23823 Valencia Boulevard
Valencia, California
91355

Prepared by:

Richard Johnson & Associates
Environmental Consultants
P.O. Box 127
Laguna Beach, CA
92651

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Laguna Beach, California
92651

May 22, 2003

A. SURVEY PURPOSE: - Pursuant to request a field survey study was conducted by this office to ascertain data in regard to species, size, overall health/vigor and evaluation rating of each tree preserved, boxed and relocated on Newhall Land and Farming and Valencia Company Projects.

Tree species include: Quercus agrifolia and Quercus lobata

B. FIELD EVALUATION – Trees surveyed were previously tagged with numbered metal discs for identification and location purposes. Individual trees were measured to ascertain tree trunk diameter (dbh) and field rated in regard to form and health based on an A, B, C, D, F scale. The letter E is not utilized as a rating classification.

A That tree is rated as an excellent specimen and needs no special attention at this time as long as construction and development impacts does not negatively effect its environment.

B That condition of the tree indicated need for pruning (deadwood removal), and that by implementing reasonable preservation procedures and practices tree has excellent potential to survive planned development if construction guidelines and post-construction maintenance is followed.

C That condition of tree indicates need for extensive corrective maintenance with no assurance it will survive construction impact.

D That condition of the tree proposed for removal with reference to seriously debilitating disease or danger of falling is such that it cannot be remedied through reasonable preservation procedures and practices.

F No signs of life. No viable foliage.

Trees were protected, at all times, from compaction and mechanical injury and excellent drainage was a component in all design planning. If any grading or construction occurred within the tree's dripline such activity was performed with hand implements. Supervision was required during sensitive times.

In the event there are questions regarding any of the findings and information contained in this report please, do not hesitate to give us a call.

Respectfully submitted by,

RICHARD JOHNSON & ASSOCIATES

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Appendix

Oak Trees; Care and Maintenance
Los Angeles County Department of Forester and Fire Warden.

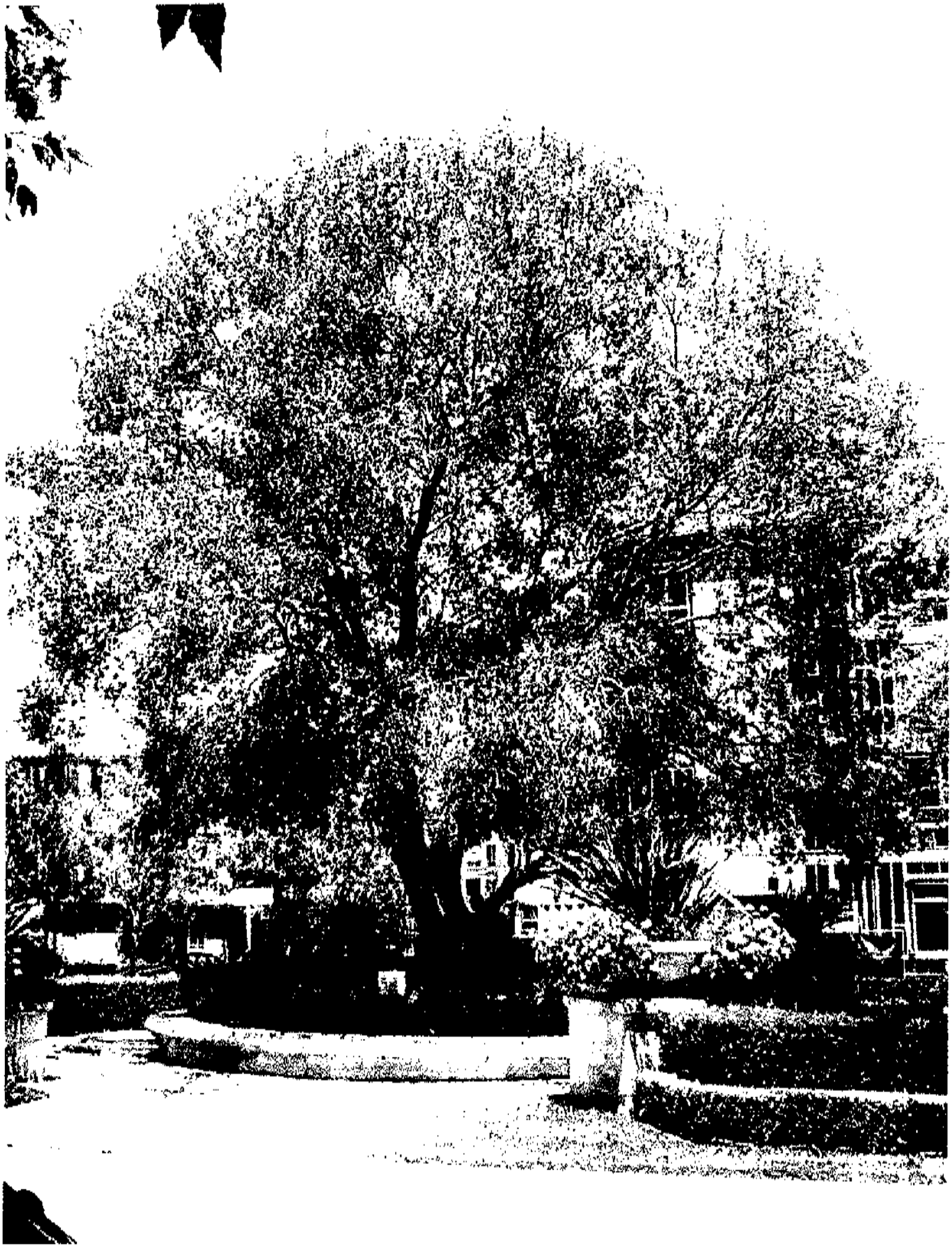
Oak Tree Data

Tree Identification Number 1308

- Species: Quercus agrifolia
- Dbh 31-inches
- Spread 20-feet
- Current 2003 Evaluation Rating A
  Rating Prior to Boxing B
- Oak Tree Permit No: 98-014
- Date Boxed: December 1, 1998
- Boxed by: Valley Crest Tree Company
- Maintained by: Valley Crest Tree Company
- Date Relocated: August, 1999
- Current Location: Village Green, West of Hyatt Hotel
- Agency Jurisdiction: City of Santa Clarita

Field Analysis:

Excellent specimen boxed and relocated from I-5 McBean Parkway area. Tree has had advantage of landscape irrigation applied to outer edge of its root ball.



VILLAGE GREEN #130R

Oak Tree Data

Tree Identification Number **No Tag Number**

- **Species:** Quercus lobata
- **Dbh** 15-inches
- **Spread** 19-feet
- **Current 2003 Evaluation Rating** B
  Rating Prior to Boxing C
- **Oak Tree Permit No:** 92075
- **Original Location:** Valencia Market Place
- **Date Boxed:** March 1995
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Senna Arborscape
- **Date Relocated:** October 1995
- **Current Location:** Valencia Market Place
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Displays new growth, minimum dieback. Doing well considering heat radiation impact from hardscape, such as parking lot and street.

Valencia Marketplace No Tag Number

Oak Tree Data

Tree Identification Number 28

- **Species:** Quercus lobata
- **Dbh** 25-inches
- **Spread** 19-feet
- **Current 2003 Evaluation Rating** A
  Rating Prior to Boxing B
- **Oak Tree Permit No:** 92-075
- **Original Location:** Valencia Marketplace
- **Date Boxed:** March 1995
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Senna Arborscape
- **Date Relocated:** October 1995
- **Current Location:** Valencia Marketplace
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Tree displays good seasonal growth.

Valencia Marketplace #28

Oak Tree Data

Tree Identification Number 109/5

- Species: Quercus lobata
- Dbh 16-inches
- Spread 14-feet
- Current 2003 Evaluation Rating B
  Rating Prior to Boxing B
- Oak Tree Permit No: 92-075
- Original Location: Valencia Marketplace
- Date Boxed: October 1995
- Boxed by: Valley Crest Tree Company
- Maintained by: VCT and Senna Arborscape
- Date Relocated: October 1995
- Current Location: Valencia Marketplace
- Agency Jurisdiction: Los Angeles County Division of Forestry

Field Analysis:

Displays good leaf color and new growth.

Valencia Marketplace #109/5

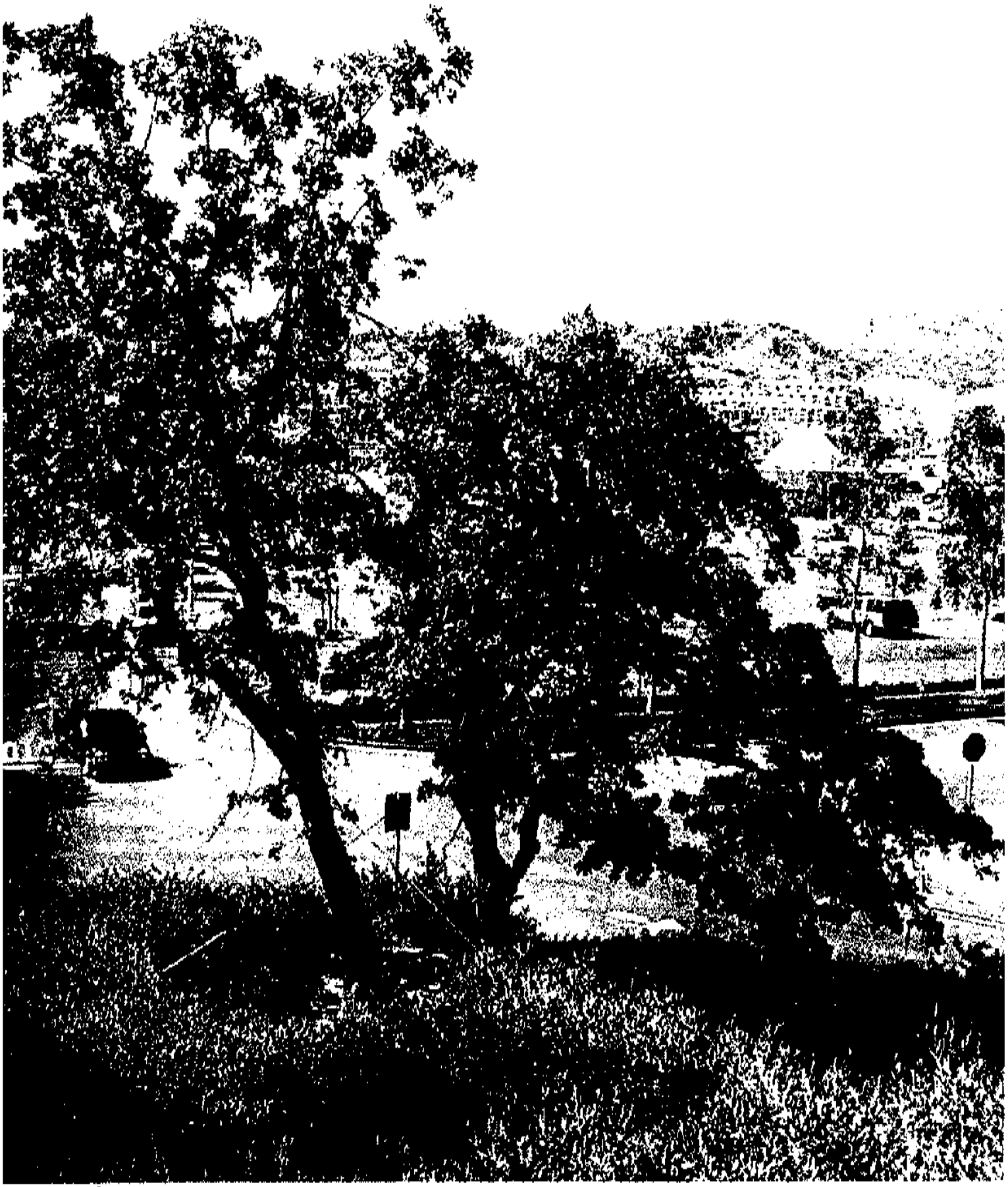
Oak Tree Data

Tree Identification Number 110

- Species: Quercus lobata
- Dbh 15-inches
- Spread 23-feet
- Current 2003 Evaluation Rating B
  Rating Prior to Boxing B
- Oak Tree Permit No: 92-075
- Original Location: Valencia Marketplace
- Date Boxed: October 1995
- Boxed by: Valley Crest Tree Company
- Maintained by: VCT and Senna Arborscape
- Date Relocated: October 1995
- Current Location: Valencia Marketplace
- Agency Jurisdiction: Los Angeles County Division of Forestry

Field Analysis:

Display good leaf color.



Valencia Marketplace #110

Oak Tree Data

Tree Identification Number 7

- Species: Quercus lobata
- Dbh 13-inches
- Spread 13-feet
- Current 2003 Evaluation Rating B
  Rating Prior to Boxing B
- Oak Tree Permit No: 92-075
- Original Location: Valencia Marketplace
- Date Boxed: October 1995
- Boxed by: Valley Crest Tree Company
- Maintained by: VCT and Senna Arborscape
- Date Relocated: January 1996
- Current Location: Valencia Marketplace
- Agency Jurisdiction: Los Angeles County Division of Forestry

Field Analysis:

Displays viable new growth.

Valencia. Marketplace. #7

Oak Tree Data

Tree Identification Number **No Tag Number**

- **Species:** Quercus lobata
- **Dbh** 21-inches
- **Spread** 19-feet
- **Current 2003 Evaluation Rating** A
  Rating Prior to Boxing B
- **Oak Tree Permit No:** 92-075
- **Original Location:** Valencia Marketplace
- **Date Boxed:** October 1995
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** VCT and Senna Arboscape
- **Date Relocated:** January 1996
- **Current Location:** Valencia Marketplace
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Displays strong growth.

Valencia Marketplace No Tag Number

Oak Tree Data

Tree Identification Number 121/8

- Species: Quercus lobata
- Dbh 24-inches
- Spread 25-feet
- Current 2003 Evaluation Rating A
  Rating Prior to Boxing C
- Oak Tree Permit No: 92-075
- Original Location: Valencia Marketplace
- Date Boxed: October 1995
- Boxed by: Valley Crest Tree Company
- Maintained by: VCT and Senna Arborscape
- Date Relocated: January 1996
- Current Location: Valencia Marketplace
- Agency Jurisdiction: Los Angeles County Division of Forestry

Field Analysis:

Displays strong growth. Excellent specimen.

Valencia Marketplace #121/8

Oak Tree Data

Tree Identification Number 26

- **Species:** Quercus lobata
- **Dbh** 13-inches
- **Spread** 16-feet
- **Current 2003 Evaluation Rating** A
  Rating Prior to Boxing B
- **Oak Tree Permit No:** 92-075
- **Original Location:** Valencia Marketplace
- **Date Boxed:** October 1995
- **Boxed by:** Valencia Marketplace
- **Maintained by:** VCT and Senna Arborscape
- **Date Relocated:** January 1996
- **Current Location:** Valencia Marketplace
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Displays excellent growth characteristics.

Valencia Marketplace #26

Oak Tree Data

Tree Identification Number **No Tag Number**

- **Species:** Quercus lobata
- **Dbh** 25-inches
- **Spread** 23-feet
- **Current 2003 Evaluation Rating** A
  Rating Prior to Boxing B
- **Oak Tree Permit No:** 92-075
- **Original Location:** Valencia Marketplace
- **Date Boxed:** October 1995
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** VCT and Senna Arborscape
- **Date Relocated:** January 1996
- **Current Location:** Valencia Marketplace
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Displays strong growth and good color.

Valencia Marketplace
No Tag Number

Oak Tree Data

Tree Identification Number **No Tag Number**

- **Species:** Quercus lobata
- **Dbh** 16-inches
- **Spread** 18-feet
- **Current 2003 Evaluation Rating** B
  Rating Prior to Boxing B
- **Oak Tree Permit No:** 87-222
- **Original Location:** Westridge
- **Date Boxed:** June 2001
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Valley Crest Tree Company
- **Date Relocated:** October 2001
- **Current Location:** TPC Golf Course
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Displays good color and strong growth characteristics.

TPC - Golf Course No TAG Number

Oak Tree Data

Tree Identification Number 254

- **Species:** Quercus lobata
- **Dbh** 9-inches
- **Spread** 8-feet
- **Current 2003 Evaluation Rating** B
  Rating Prior to Boxing B
- **Oak Tree Permit No:** 87-222
- **Original Location:** Westridge
- **Date Boxed:** June 2001
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Valley Crest Tree Company
- **Date Relocated:** October 2002
- **Current Location:** TPC Golf Course
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Abnormal growth due to missing dominate leader. Tree, however, is in good condition.

TPC Golf Course Area #254

Oak Tree Data

Tree Identification Number 253

- Species: Quercus lobata
- Dbh 32-inches
- Spread 23-feet
- Current 2003 Evaluation Rating B
  Rating Prior to Boxing B
- Oak Tree Permit No: 87-222
- Original Location: Westridge
- Date Boxed: June 2001
- Boxed by: Valley Crest Tree Company
- Maintained by: Valley Crest Tree Company
- Date Relocated: October 2001
- Current Location: TPC Golf Course
- Agency Jurisdiction: Los Angeles County Division of Forestry

Field Analysis:

Displays new seasonal growth.

TCP #253 Middle Oak

Oak Tree Data

Tree Identification Number No Tree Number

- Species: Quercus lobata
- Dbh 32-inches
- Spread 23-feet
- Current 2003 Evaluation Rating B
  Rating Prior to Boxing B
- Oak Tree Permit No: Not Applicable
- Original Location: College of the Canyons
- Date Boxed: June 2001
- Boxed by: Valley Crest Tree Company
- Maintained by: Valley Crest Tree Company
- Date Relocated: October 2001
- Current Location: Westridge – Valencia Blvd.
- Agency Jurisdiction: Los Angeles County Division of Forestry

Field Analysis:

Displays moderate dieback on east side of canopy. Also displays new seasonal growth.

Westridge # 2

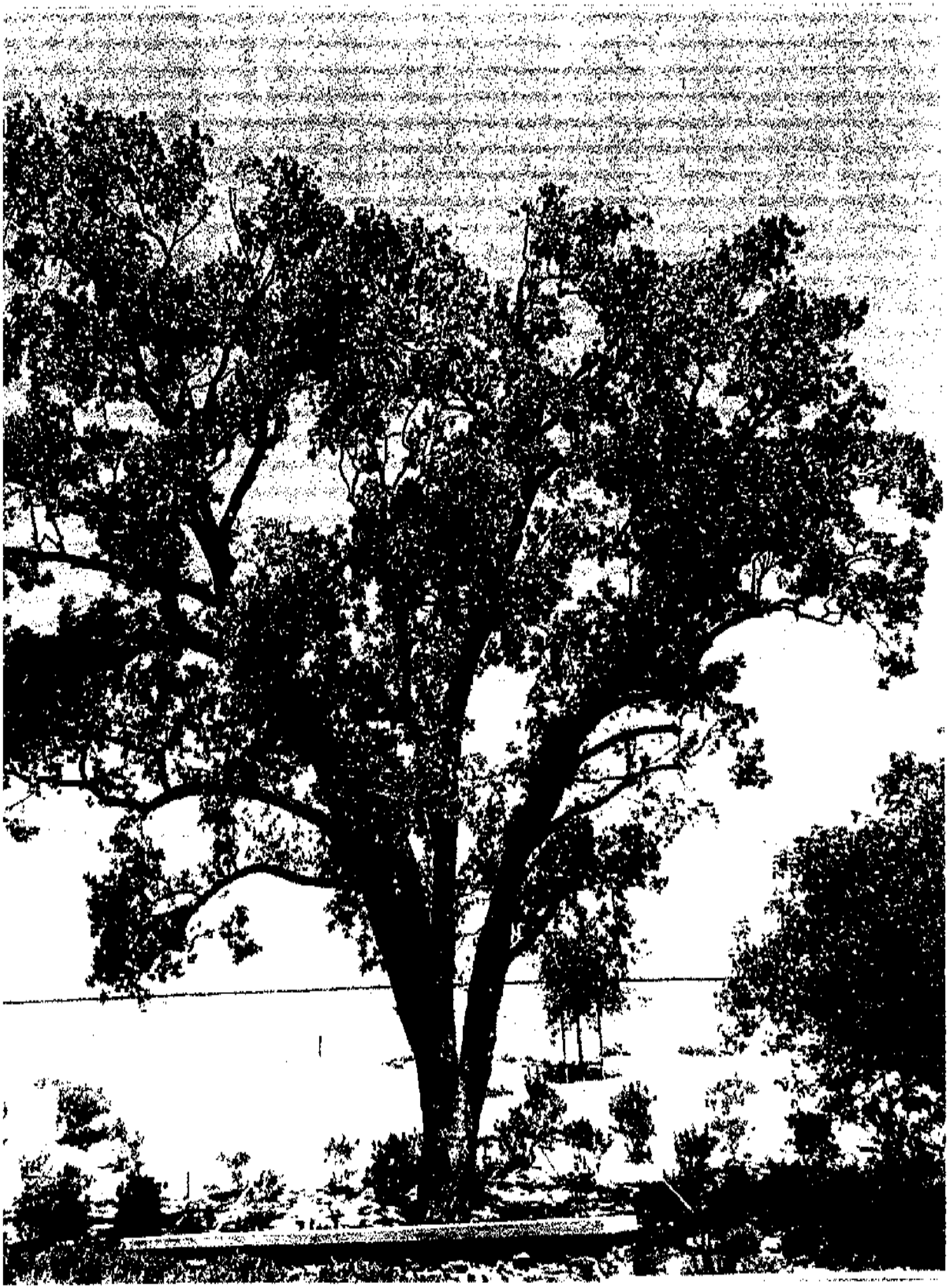
Oak Tree Data

Tree Identification Number 26

- Species: Quercus lobata
- Dbh 28-inch
- Spread 25-feet
- Current 2003 Evaluation Rating A
  Rating Prior to Boxing B
- Oak Tree Permit No: Not Applicable
- Original Location: College of the Canyons
- Date Boxed: June 2001
- Boxed by: Valley Crest Tree Company
- Maintained by: Valley Crest Tree Company
- Date Relocated: October 2001
- Current Location: Street Planting – Valencia Blvd.
- Agency Jurisdiction: Los Angeles County Division of Forestry

Field Analysis:

Displays new seasonal growth. No dieback observed.



Oestridae #26

Oak Tree Data

Tree Identification Number 38

- **Species:** Quercus lobata
- **Dbh** 18-inches
- **Spread** 18-feet
- **Current 2003 Evaluation Rating** B
  Rating Prior to Boxing C
- **Oak Tree Permit No:** Not Applicable
- **Original Location:** College of the Canyons
- **Date Boxed:** June 2001
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Valley Crest Tree Company
- **Date Relocated:** October 2001
- **Current Location:** Valencia Boulevard
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Displays good new seasonal growth.

Westridge #38

Oak Tree Data

Tree Identification Number 36

- **Species:** Quercus lobata
- **Dbh** 30-inches
- **Spread** 23-feet
- **Current 2003 Evaluation Rating** A
  Rating Prior to Boxing B
- **Oak Tree Permit No:** Not Applicable
- **Original Location:** College of the Canyons
- **Date Boxed:** June 2001
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Valley Crest Tree Company
- **Date Relocated:** October 2001
- **Current Location:** Valencia Boulevard
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Nice specimen oak. Displays new growth.

Westridge # 36

Oak Tree Data

Tree Identification Number 1

- **Species:** Quercus lobata
- **Dbh** 40-inches
- **Spread** 25-feet
- **Current 2003 Evaluation Rating** B
  Rating Prior to Boxing B
- **Oak Tree Permit No:** Not Applicable
- **Original Location:** Collage of the Canyons
- **Date Boxed:** June 2001
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Valley Crest Tree Company
- **Date Relocated:** October 2001
- **Current Location:** Heritage View Lane - Westridge
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Displays new, weak seasonal growth.

Westridge #1

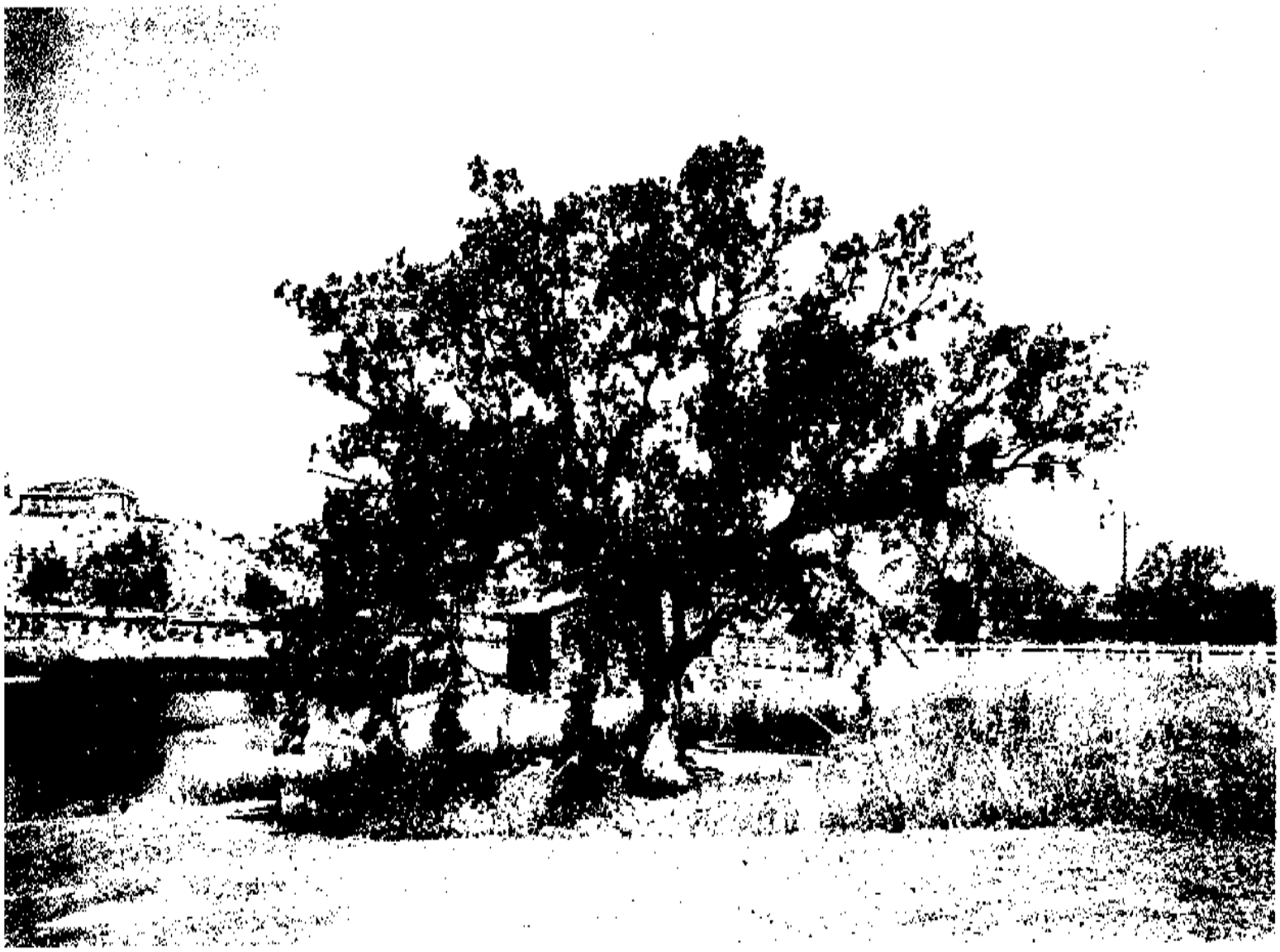
Oak Tree Data

Tree Identification Number 31

- **Species:** Quercus lobata
- **Dbh** 29-inches
- **Spread** 25-feet
- **Current 2003 Evaluation Rating** B
  Rating Prior to Boxing C
- **Oak Tree Permit No:** Not Applicable
- **Original Location:** College of the Canyons
- **Date Boxed:** June 2001
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Valley Crest Tree Company
- **Date Relocated:** October 2001
- **Current Location:** Heritage View Lane - Westridge
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Moderate dieback at outer branch ends. Minor dieback of seasonal growth.



Westridge #31

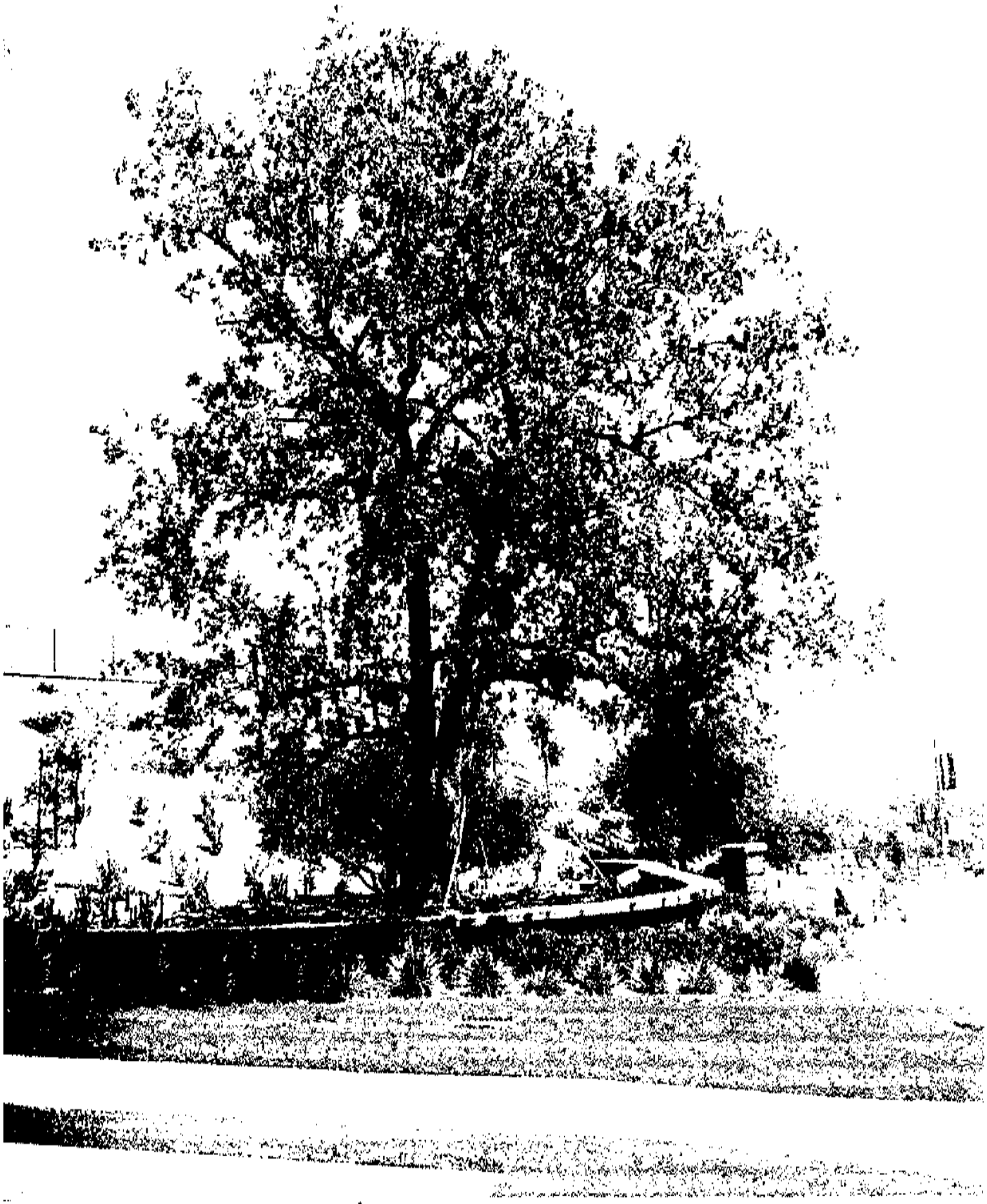
Oak Tree Data

Tree Identification Number 14

- Species: Quercus lobata
- Dbh 29-inches
- Spread 24-feet
- Current 2003 Evaluation Rating A
  Rating Prior to Boxing B
- Oak Tree Permit No: 87-222
- Original Location: Westridge
- Date Boxed: June 2001
- Boxed by: Valley Crest Tree Company
- Maintained by: Valley Crest Tree Company
- Date Relocated: October 2001
- Current Location: Willow Brook Lane - Westridge
- Agency Jurisdiction: Los Angeles County Division of Forestry

Field Analysis:

Displays strong, new seasonal growth.



Westside #14

Oak Tree Data

Tree Identification Number 5

- **Species:** Quercus lobata
- **Dbh** 25-inches
- **Spread** 26-feet
- **Current 2003 Evaluation Rating** B
  Rating Prior to Boxing C
- **Oak Tree Permit No:** Not Applicable
- **Original Location:** College of the Canyons
- **Date Boxed:** June 2001
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Valley Crest Tree Company
- **Date Relocated:** October 2001
- **Current Location:** Willow Brook Lane - Westridge
- **Agency Jurisdiction:** Los Angeles County Division of Forestry

Field Analysis:

Mild to moderate tip dieback with heavy epicormic growth. Good structure and seasonal growth.

Westridge #5

Oak Tree Data

Tree Identification Number 2

- Species: Quercus lobata
- Dbh 25-inches
- Spread 23-feet
- Current 2003 Evaluation Rating B
  Rating Prior to Boxing C
- Oak Tree Permit No: 00-157
- Original Location: I-5 Interchange
- Date Boxed: May 2001
- Boxed by: Valley Crest Tree Company
- Maintained by: Valley Crest Tree Company
- Date Relocated: November 2001
- Current Location: I-5 Interchange
- Agency Jurisdiction: City of Santa Clarita

Field Analysis:

This tree is still in the process of budding out.

I-5/ Valencia Interchange

2

Oak Tree Data

Tree Identification Number 7

- Species: Quercus lobata
- Dbh 36-inches
- Spread 29-feet
- Current 2003 Evaluation Rating A
  Rating Prior to Boxing B
- Oak Tree Permit No: 00-157
- Original Location: I-5 Interchange
- Date Boxed: May 2001
- Boxed by: Valley Crest Tree Company
- Maintained by: Valley Crest Tree Company
- Date Relocated: November 2001
- Current Location: I-5 Interchange
- Agency Jurisdiction: City of Santa Clarita

Field Analysis:

Displays strong seasonal growth.

I-5/ Valencia Interchange #7

Oak Tree Data

Tree Identification Number 42

- **Species:** Quercus agrifolia
- **Dbh** 28"/18" multi-trunked
- **Spread** 17 feet
- **Current 2003 Evaluation Rating** B
  Rating Prior to Boxing B
- **Oak Tree Permit No:** 96-007
- **Original Location:** Hasley Hills
- **Date Boxed:** October 1997
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Valley Crest Tree Company
- **Date Relocated:** February 1998
- **Current Location:** Hyatt Hotel – Lobby Planter at Entrance
- **Agency Jurisdiction:** City of Santa Clarita

Field Analysis:

Moderate dieback in interior below new growth. Displays good, new seasonal growth.

Hyatt Hotel@Valencia
42

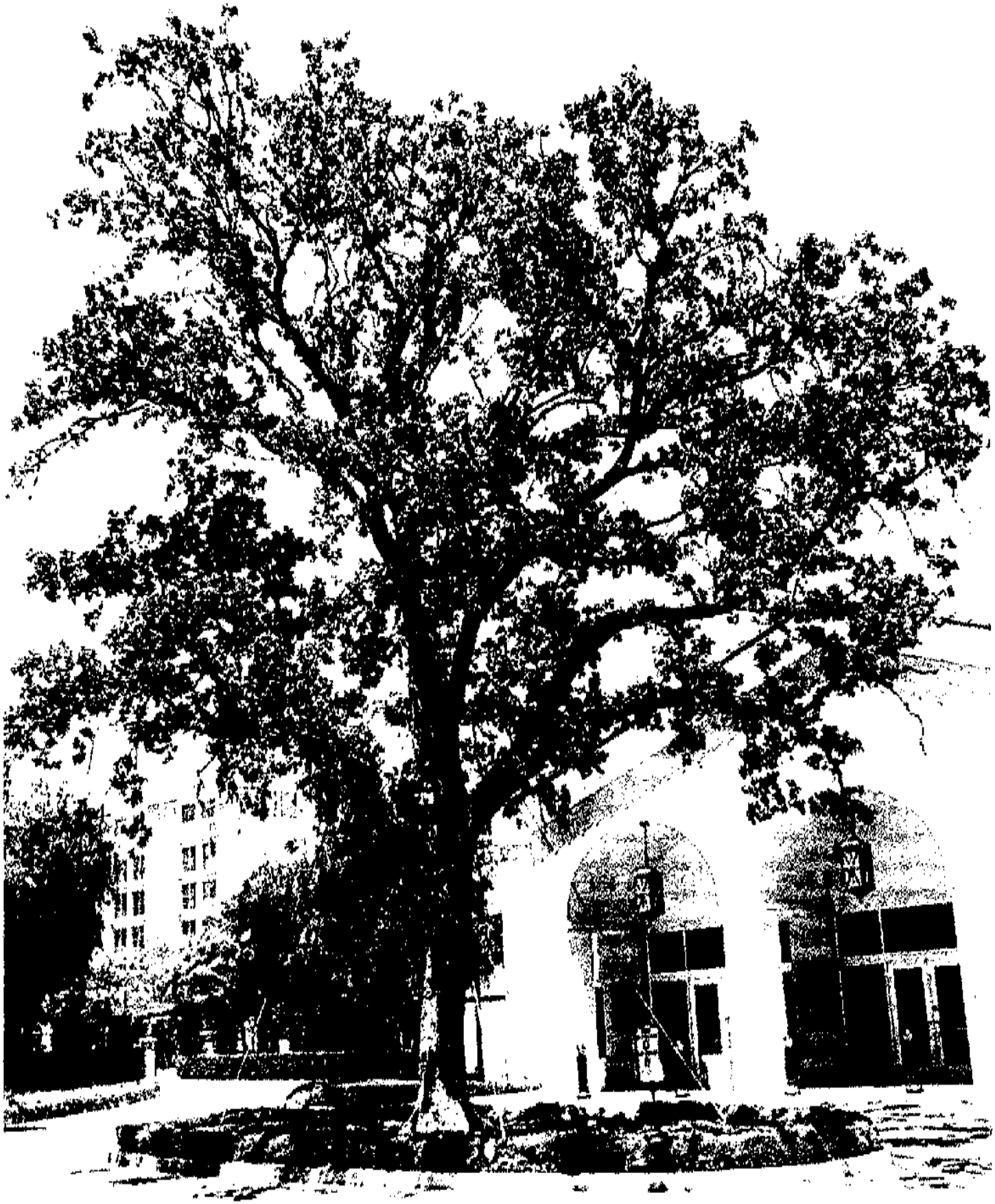
Oak Tree Data

Tree Identification Number 137

- **Species:** Quercus lobata
- **Dbh** 22-inches
- **Spread** 25-feet
- **Current 2003 Evaluation Rating** B
  Rating Prior to Boxing B
- **Oak Tree Permit No:** 96-007
- **Original Location:** Woodlands/North Hills
- **Date Boxed:** October 1997
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Valley Crest Tree Company
- **Date Relocated:** February 1998
- **Current Location:** Hyatt Hotel – in Driveway Circular Planter
- **Agency Jurisdiction:** City of Santa Clarita

Field Analysis:

Displays new seasonal growth.



Hyatt Hotel @ Valencia #137

Oak Tree Data

Tree Identification Number 156

- Species: Quercus lobata
- Dbh 38-inches
- Spread 28-feet
- Current 2003 Evaluation Rating B
  Rating Prior to Boxing B
- Oak Tree Permit No: 96-007
- Original Location: Woodlands/North Hills
- Date Boxed: October 1997
- Boxed by: Valley Crest Tree Company
- Maintained by: Valley Crest Tree Company
- Date Relocated: February 1998
- Current Location: Hyatt Hotel – Corner Parking Lot Planter
- Agency Jurisdiction: City of Santa Clarita

Field Analysis:

Moderate tip dieback. Displays new seasonal growth.

Hyatt Hotel @ Valencia
#156

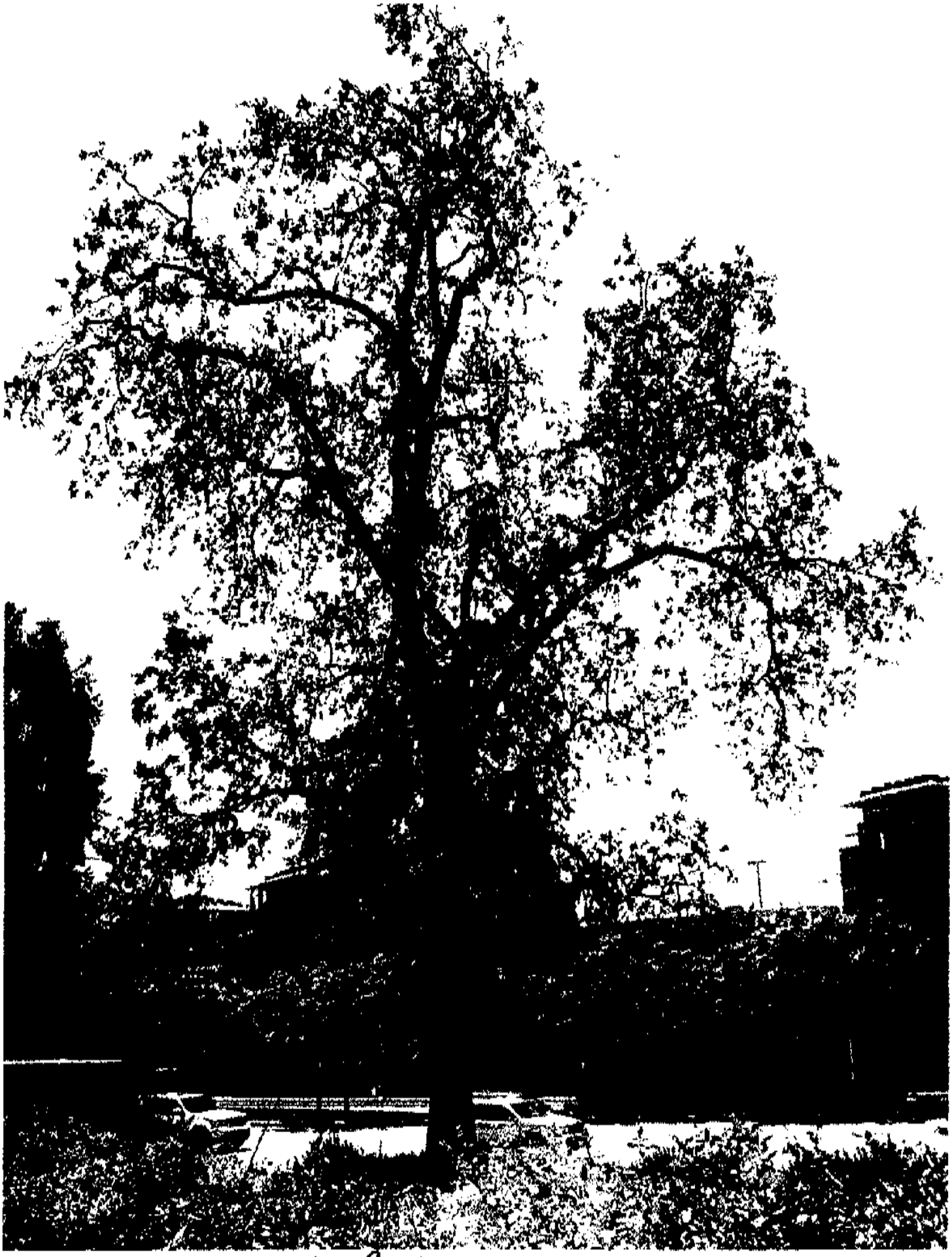
Oak Tree Data

Tree Identification Number 123/127

- Species: Quercus lobata
- Dbh 33-inches
- Spread 27-feet
- Current 2003 Evaluation Rating B
  Rating Prior to Boxing B
- Oak Tree Permit No: 87-027
- Original Location: Woodlands/North Hills
- Date Boxed: November 1988
- Boxed by: Valley Crest Tree Company
- Maintained by: Valley Crest Tree Company
- Date Relocated: January 1989
- Current Location: Valencia Town Center
- Agency Jurisdiction: City of Santa Clarita

Field Analysis:

Mild dieback of current seasonal growth. Tree displays good structure.



Valencia Town Center #123/127

Oak Tree Data

Tree Identification Number 103/107

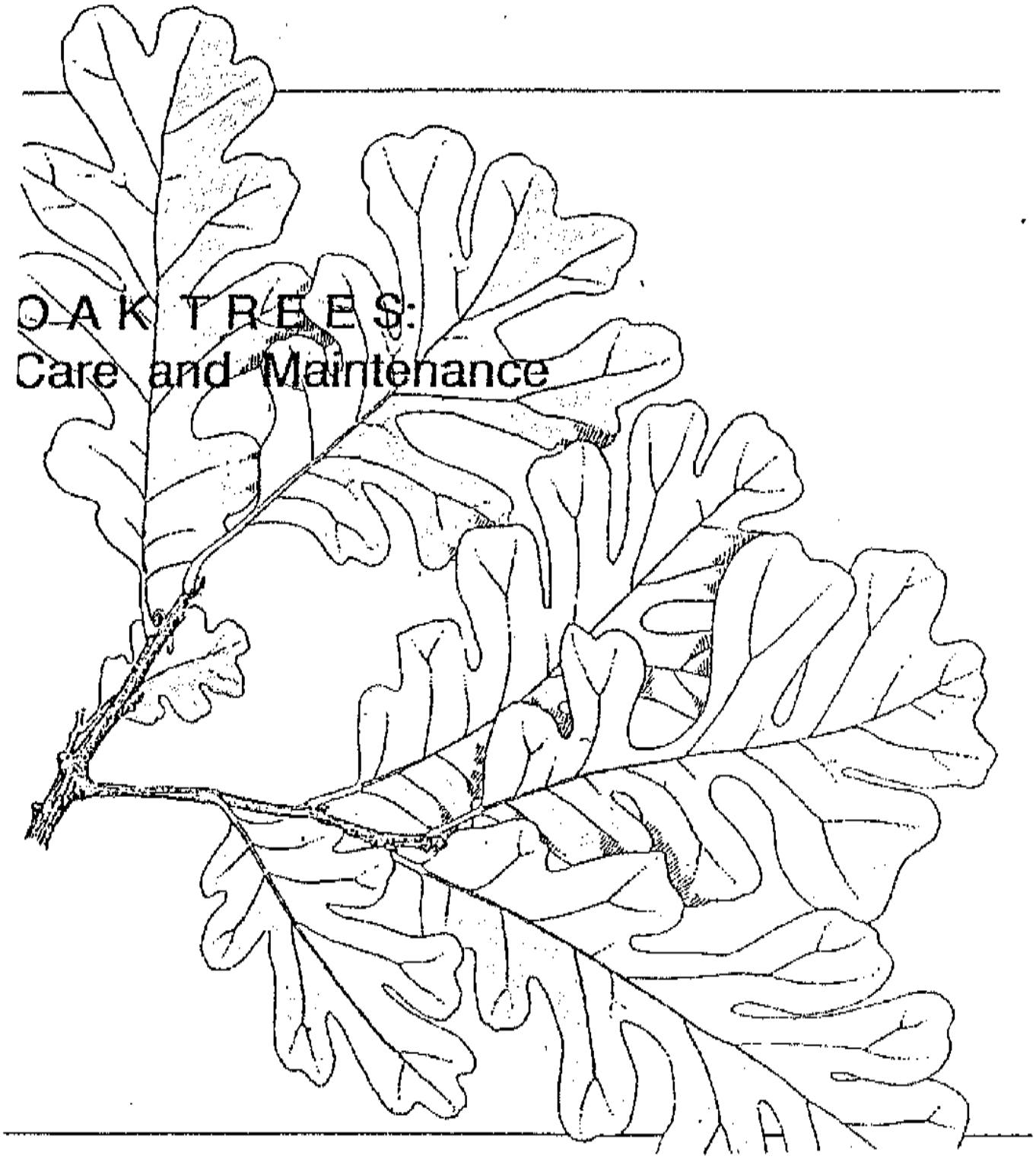
- **Species:** Quercus lobata
- **Dbh** 29-inches
- **Spread** 25-feet
- **Current 2003 Evaluation Rating** A
  Rating Prior to Boxing B
- **Oak Tree Permit No:** 87-027
- **Original Location:** Woodland/North Hills
- **Date Boxed:** November 1988
- **Boxed by:** Valley Crest Tree Company
- **Maintained by:** Valley Crest Tree Company
- **Date Relocated:** January 1989
- **Current Location:** Valencia Town Center
- **Agency Jurisdiction:** City of Santa Clarita

Field Analysis:

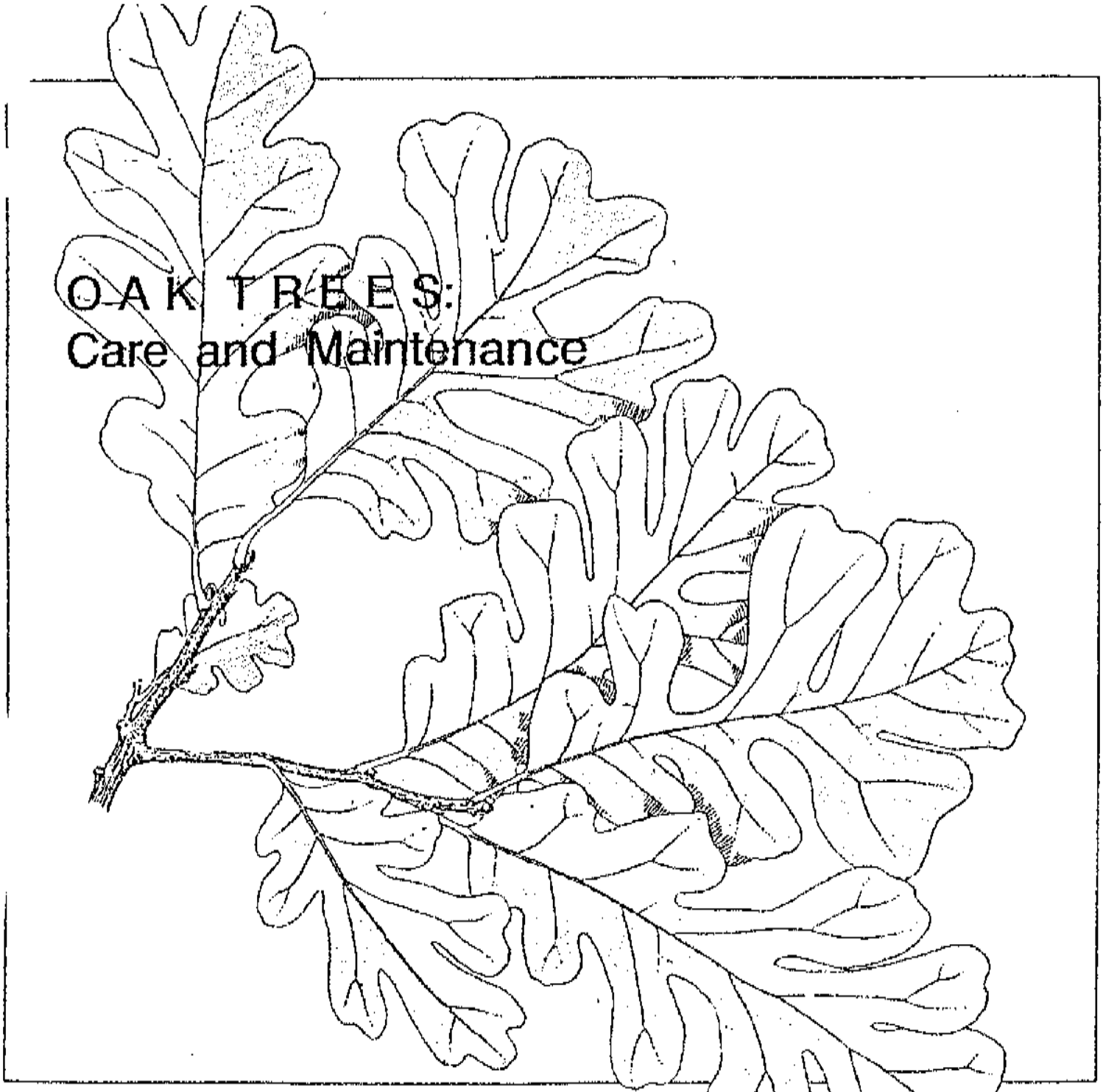
Displays good seasonal growth characteristics.

Valencia Town Center
#103/107

OAK TREES:
Care and Maintenance



OAK TREES: Care and Maintenance



This Oak Tree Care and Maintenance Guide offers basic information and practical guidelines aimed at the preservation and continued health and survival of oak trees in the residential landscape.

Increasing pressure for development is hanging the Oak Woodlands of Los ıles County. Heritage oaks which ·vived in open rolling hills are preserved or replanted and to the community.

How do we protect these trees during the planning and development process, and insure their survival once they are in the home garden?

The Oak Tree

Oak trees in the residential landscape often suffer decline and early death due to conditions that are easily preventable. Damage can often take years to become evident, and by the time the tree shows obvious signs of disease it is usually too late to help.

Improper watering, especially during the hot summer months, and disturbance to critical root areas are most often the causes. This booklet will provide guidelines on where these critical areas lie and ways to avoid disturbing them, as well as information on long term care and maintenance of both natural and planted oaks. Lists of additional resources for more information and demonstration areas to visit are also included.

ree Ordinance

os, jeles County Oak Tree
as been established to
ak trees as significant
esthetic, and ecological
The goal of the ordinance
favorable conditions for the
on and propagation of this
d threatened plant heritage.
g this part of the development
healthy oak trees will be
d and maintained.

Angeles County Oak Tree
nce applies to all unincorporated
f the County. Individual cities
ave their own ordinances, and
equirements may be more
ent.

it Requirements:
er the Los Angeles County
inance, a person shall not cut,
troy, remove, relocate, inflict
nage, or encroach into the
tected zone (see text) of any tree
oak tree genus without first
ing a permit.

amage includes but is not limited to:

- burning
- application of toxic substances
- pruning or cutting
- trenching
- excavating
- paving
- operation of machinery or equipment
- changing the natural grade.

ction 22.56.2050: Oak Tree Permit
gulations, Los Angeles County.
te of Adoption: September 13, 1988

or more information on the Oak Tree
ermit, contact:
he Los Angeles County Dept. of
egional Planning
20 W. Temple Street
Angeles CA 90012
974-6401

Types of oaks commonly found in Los Angeles County:

Many kinds of oak trees are native to Los Angeles County. A few of the more common ones are shown below, but *all* oak trees are covered by the oak tree ordinance.

Older oaks which have thrived under the natural rainfall patterns of dry summers and wet winters often can't handle the extra water of a garden setting. These trees must be treated with special care if they are to survive.

Those oaks that have been planted into the landscape or sprouted as volunteers tend to be more tolerant of watered landscapes. While these vigorous young trees may grow 1 1/2 to 4 feet a year in height under good conditions they are not as long-lived. Once established these trees would benefit from the same special care outlined in this guide.

Valley Oak
QUERCUS LOBATA

LARGE DECIDUOUS TREE 60'-75' HIGH, BROADLY SPREADING 50'-80' WIDE.

LEAVES: DEEP GREEN, 3"-4" LONG, PAPER-LIKE TEXTURE WITH DEEP ROUNDED LOBES ON THE LEAF EDGE.

TENDS TO FAVOR VALLEY BOTTOMS; FOR THIS REASON THE VALLEY OAK HAS DISAPPEARED FROM THE LANDSCAPE MORE RAPIDLY, IMPACTED SEVERELY BY AGRICULTURE AND URBAN DEVELOPMENT.

Coast Live Oak
QUERCUS AGRIFOLIA

LARGE EVERGREEN TREE WITH A BROAD, ROUND SHAPE AND LARGE LIMBS. 30'-70' HIGH, 35'-80' WIDE.

LEAVES: GLOSSY GREEN, 1"-3" LONG; SPINY, ROUNDED, AND HOLLY-LIKE; BUT DISTINCTLY CUPPED OR CURLED UNDER AT THE EDGES.

Interior Live Oak
QUERCUS WISLIZENII

EVERGREEN TREE 30'-75' HIGH OR A SHRUB 8'-10' HIGH IN CHAPARRAL AREAS. HAS A FULL, DENSE ROUNDED SHAPE, NOT BROAD OR WITH LARGE LIMBS LIKE A COAST LIVE OAK. THEY TEND TO GROW IN CLUMPS RATHER THAN AS A SINGLE TREE.

LEAVES: DARK GREEN, 1"-4" LONG. EDGES EITHER SMOOTH OR SPINY, BUT ALWAYS FLAT — NOT CURLED UNDER.

OTHER COMMON OAKS:
CALIFORNIA BLACK OAK: QUERCUS KELLOGGII
CANYON LIVE OAK: QUERCUS CHRYSOLEPIS
ENGELMANN OAK: QUERCUS ENGELMANNII

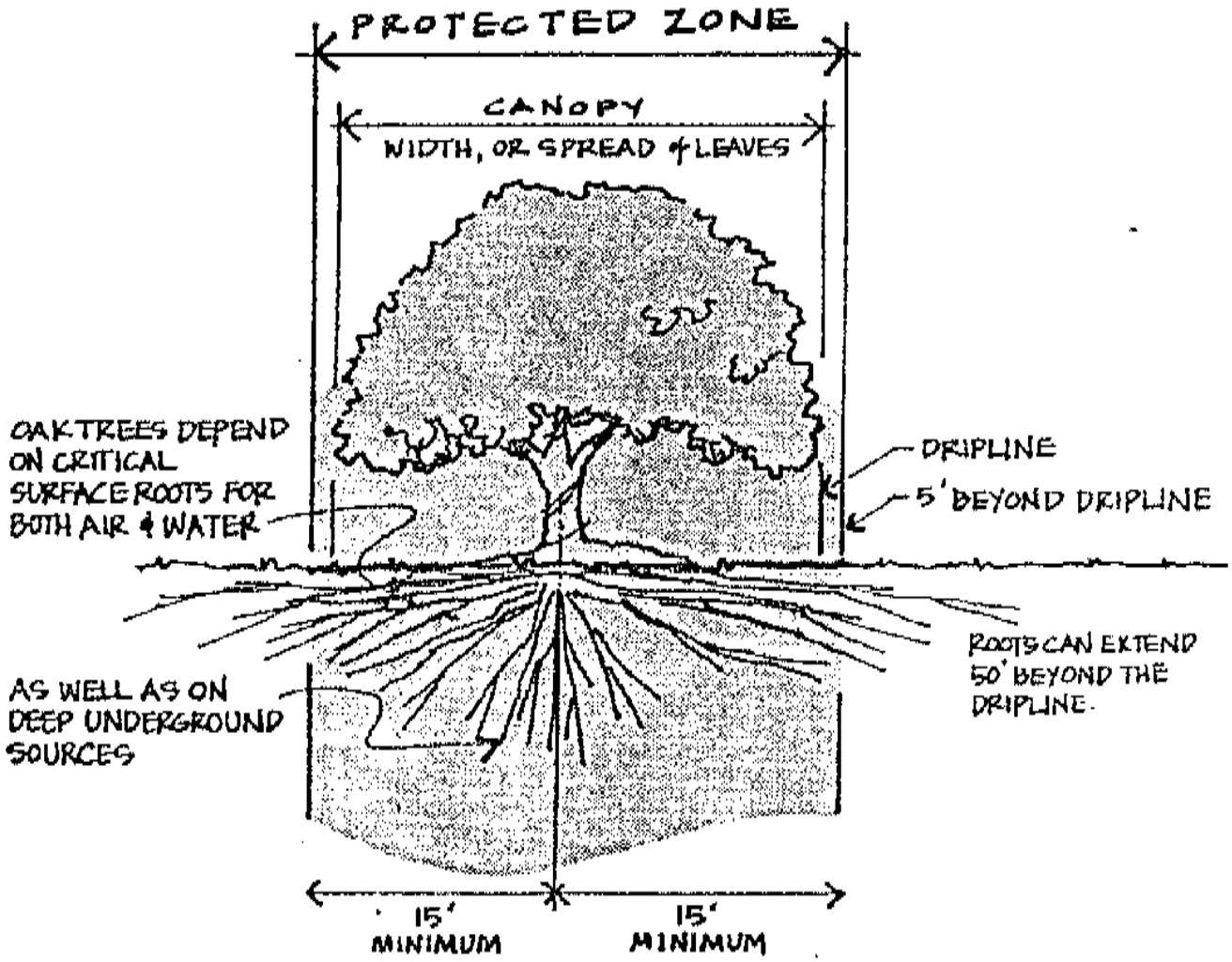
PROTECTED ZONE

otected zone defines the area most critical to the health and continued survival of an oak tree. Oaks are easily ped and very sensitive to disturbances that occur to the tree or in the surrounding environment.

ot system is extensive but surprisingly shallow, radiating out as much as 50 feet beyond the spread of the tree s, or *canopy*. The ground area at the outside edge of the canopy, referred to as the *dripline*, is especially tant: the tree obtains most of its surface water and nutrients here, as well as conducts an important exchange of air ther gases.

protected zone is defined in the Oak Tree Ordinance as follows:

The Protected Zone shall mean that area within the dripline of an oak tree and extending therefrom to a point at least 5 feet outside the dripline or 15 feet from the trunk, whichever distance is greater."



·RUCTION ACTIVITY WITHIN ROTECTED ZONE

in Grade

ge in the level of soil around ree can have a negative The most critical area lies to 10' of the trunk: no soil be added or scraped away. should drain away from this nd not allowed to pond so that mains wet at the base.

ining walls designed to hold soil above or below an existing should be avoided if at all ssible, especially within the otected zone. These types of ructures cause critical areas at the ripline to be buried, or require that najor roots be severed. Water trapped at the base of the tree could lead to root rot or other impacts, and to the decline and premature death of a highly valued landscape tree.

nstruction activities outside the ected zone can have damaging pacts on existing trees. Underground water sources can be cut off due to falling water tables, or drainage may be disrupted.

Trenching

Digging of trenches in the root zone should be avoided. Roots may be cut or severely damaged, and the tree can be killed.

If trenches must be placed within the protected zone, utilities can be placed in a conduit which has been bored through the soil, reducing damage to the roots. Insist that as many utilities as allowed be placed in a single trench, instead of the common practice of digging a separate trench for each individual line.

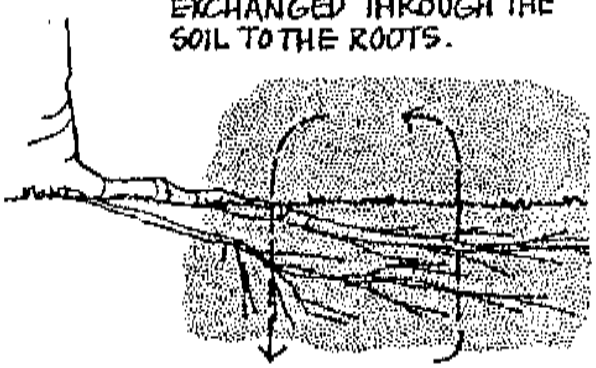
Trenching can also be accomplished using hand tools or small hand held power equipment to avoid cutting roots. Any roots exposed during this work should be covered with wet burlap and kept moist until the soil can be replaced.

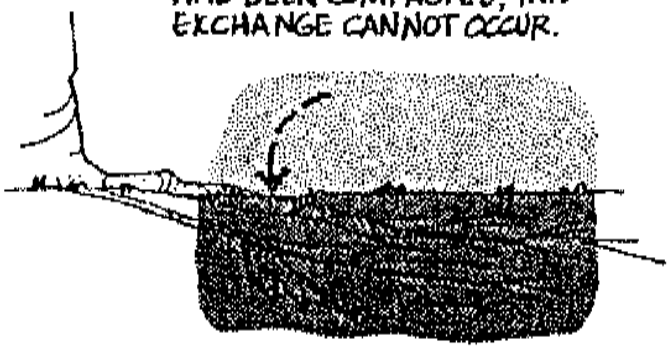
Soil Compaction and Paving

The roots depend upon an important exchange of both water and air through the soil within the protected zone. Any kind of activity which compacts the soil in this area blocks this exchange and can have serious long term negative effects on the tree.

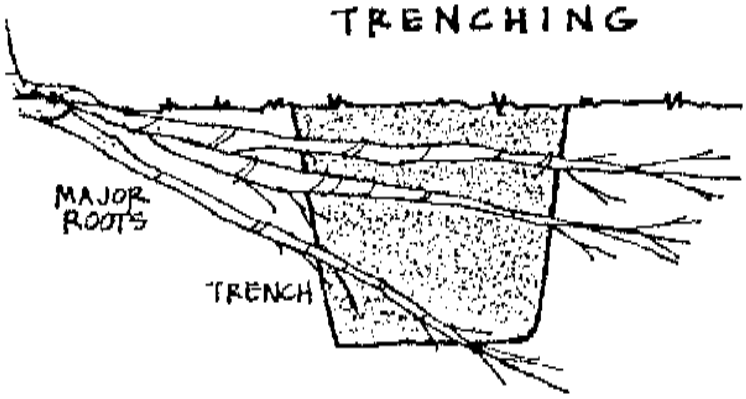
If paving material must be used, some recommended surfaces include brick paving with sand joints, or ground coverings such as wood chips (note the advantages of natural materials for providing nutrients under *mulching*).

SOIL COMPACTION





TRENCHING



INSIDE THE TRENCH, PLACE UTILITY CONDUIT BETWEEN OR UNDERNEATH MAJOR ROOTS.

;eases and Pests

;s that are stressed, especially ɔecause of improper watering ɔractices, are prone to certain diseases and attacks by pests.

The most damaging of these diseases is the Oak Root Fungus *Armillaria mellea*. Occurring naturally n the soil, the fungus thrives under wet conditions and dies back in the summer when soils dry out. This is why summer watering of oaks can be a deadly practice. As noted in the watering guidelines, wet soil in the summer allows the fungus to grow all year. As the population grows, their natural food sources are depleted and they begin feeding on oak tree roots. The fungus does not require an open wound in the tree to gain entry.

Indications of the fungus include:

- die back of branches or tips.
- honey colored fungus at or near the root crown.
  white fan-like fungus between the bark and wood.
- the presence of black, shoestring like growths in the soil.

Once the tree begins to show obvious signs of infection treatment is generally ineffective. The best treatment is to *avoid* the conditions that lead to oak root fungus infections.

Pit Scale, Oak Moth, and other pests: any significant changes in leaf color, branch die back, presence of black sooty materials on leaves or other changes should be noted. Seek the advice of a professional forester, arborist, farm advisor or other expert before spraying any pesticides on an oak tree.

Planting Underneath Oaks

The natural leaf litter is by far the best ground cover within the protected zone. If plants must be placed, the following guidelines should be followed:

There should be no planting within a minimum 6 to 10 feet of the trunk.

Avoid plants that require any supplemental water once established.

Choose plants suited for "dry shade." Those listed in the box below offer some good choices. To see some examples of how these plants have been used under oaks refer to the Additional Resources section on the following page.

PLANTS TO CONSIDER:

Plant Name	Description
Arctostaphylos densiflora 'Howard McMinn' Manzanita	3' high, 6' wide. Toughest of available forms. Whitish-pink flowers.
Arctostaphylos edmundsii Little Sur Manzanita	1-2' high, 4-5' wide. Tolerant of full shade.
Arctostaphylos hookeri Monterey Carpet Manzanita	1-2' high, spreading to 12' wide by rooting branches. White to pink flowers.
Ceanothus griseus horizontalis Carmel Creeper	Less than 2 1/2' tall, low and creeping. Clusters of small blue flowers.
Heuchera Coral Bells	2-4' mound. Flowers on an upright stem 2-3" high and spotted with red or pink.
Mahonia aquifolium compacta Oregon Grape	2-4' high, spreading by underground roots. Bright yellow flower clusters.
Ribes viburnifolium Evergreen or Catalina Currant	2-3' high, spreading to 12' wide. Flowers pink to red in small clusters.

NOTES:

Before deciding on plants, check a source such as the *Sunset Western Garden Book* to determine which plants will grow in your area.

When choosing shade tolerant plants, consider that the ground under the south side of the tree will get more sunlight. In this hemisphere the sun stays lower in the southern sky all year, causing the tree to block the light. This causes the northern side to stay in deeper shade.

Summary of Late Winter and Spring Surveys
with Focus on the California Condor
Bloom Biological, Inc., July 2007

SUMMARY OF LATE WINTER AND SPRING AVIAN SURVEY -- WITH FOCUS ON THE CALIFORNIA CONDOR (*GYMNOGYPS CALIFORNIANUS*) ON PORTIONS OF NEWHALL LAND AND FARMING COMPANY PROPERTY, LOS ANGELES COUNTY, CALIFORNIA

Prepared For: THE NEWHALL LAND AND FARMING COMPANY
23823 Valencia Blvd.
Valencia, CA 91355

Prepared By: BLOOM BIOLOGICAL, INC.
13611 Hewes Ave.
Santa Ana, CA 92705

Date: 13 July 2007

INTRODUCTION

Extensive field surveys of all occurring and potentially occurring special-status, or sensitive, avian species and all raptors (both common and special-status) were conducted on portions of Newhall Land and Farming Company property by Bloom Biological, Inc. from February through June, 2007. Special emphasis was placed on finding raptor nest locations and sensitive riparian birds. This summary focuses on the findings of the survey effort relative to the California condor (*Gymnogyps californianus*).

The entire survey area consisted of approximately 25 miles of the Santa Clara River and its major tributaries in and around Valencia, Los Angeles County, California. Tributaries that were included in the survey area were lower Castaic Creek, San Francisquito Canyon, and the South Fork of the Santa Clara River. The limits of the survey area include the entire Santa Clara River from ¼ mile downstream of the Las Brisas Crossing in Ventura County upstream to the future location of the Golden Valley Bridge (east of the Los Angeles Aqueduct). The survey area encompassed all habitats within the riverbed and approximately ½ mile on each side of the river. Contained within this general survey area was the Landmark Village project impact area (**Figure 1**), including an area up to one mile beyond the project site boundary.

METHODOLOGY

Wintering bird surveys, burrowing owl surveys, and raptor nest surveys were conducted between 24 February and 25 March, 2007. Raptor nest surveys continued throughout the spring and continue beyond the writing of this report. Surveys were conducted up to one mile out from the Landmark Village project impact area boundary. Surveys were conducted during daylight hours as well as up to four hours after sunset. Surveys were conducted by walking and/or driving systematically along dirt roads, foot paths, streambeds, and canyon bottoms throughout the survey area. GPS waypoint locations were recorded for all active raptor nests as well as suspected nest sites. All active nests were monitored throughout the survey period to determine outcome.

Although all bird species detected were recorded, special emphasis was placed on finding those considered to be of special status by federal and state resource agencies and conservation organizations. Special-status birds were surveyed within the riparian area and within the adjacent agricultural areas within the Landmark Village impact area. No effort was spent surveying for special-status upland (e.g., coastal sage scrub) bird species during these surveys, but species were noted when detected.

SUMMARY

California Condor **Not Observed**
(*Gymnogyps californianus*)

CONSERVATION STATUS: Federally Endangered, California Endangered, California Fully Protected, California Department of Forestry and Fire Protection Sensitive, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.

THREATS: Currently, lead poisoning, consumption of microtrash, collisions with wires and poles, shooting, contaminant poisoning, and long-term habitat loss.

HABITAT: Remote hilly and mountainous regions with cliff sites for nesting and adequate numbers of deer and livestock to provide carrion food source.

DISTRIBUTION: In historic times, Tehachapi and Greenhorn Mountains, Coast Ranges, and southern Sierra Nevada. Relocation efforts have centered on historical range as well as Grand Canyon of Arizona and in northern Baja California.

POTENTIAL TO OCCUR ON SITE: Re-introduced into the local mountains beginning in 1992 from captive breeding program as part of the California Condor Recovery Program. This wide-ranging species nests on remote cliffs but forages over hundreds of square miles, and is known to at least fly over the site (U.S. Fish and Wildlife Service and Ventana Wilderness Society).

BACKGROUND

The California condor is the largest of the New World vultures, in the family Cathartidae (AOU 2006), with the Andean condor (*Vultur gryphus*) as the closest extant relative. Because of their morphological and behavioral similarity, Andean condors were first used as surrogates of California condors to develop the current reintroduction programs. Adult California condors weigh, on average, 8.8 kg (male) and 8.1 kg (female) with a wingspan of approximately 2.8 meters (Snyder and Schmitt 2002). Sexual maturity is typically reached between 6 and 8 years of age for both males and females (Koford 1953, Snyder 1988, Snyder and Snyder 2000, Snyder and Schmitt 2002). Condors are known to be monogamous, with pair bonds maintained over multiple years. Nest sites are in large diameter trees or in potholes on cliffs; both types of nest sites are sheltered from inclement weather. One egg is laid per nest attempt (end of January – April) (unless a nest failure occurs; recycling has been documented for this species); incubation is approximately 57 days, with fledging of chicks at 5.5-6 months old, and independence approximately 6 months later (Snyder and Hamber 1985, Snyder and Snyder 2000, Snyder and Schmitt 2002).

Paleontological evidence of the California condor shows that the species was common throughout North America from at least the late Pleistocene (40,000 years before present) (Snyder and Snyder 2000, Snyder and Schmitt 2002). In the early nineteenth century, the species occurred in California, Oregon, Washington; southern British Columbia, Canada; and Baja California, Mexico. By the mid-twentieth century, California condors were largely confined to southern California.

HABITAT USE

The California condor is found in varying habitat and climate tolerances; from sea level to upper elevation meadows and forests, including redwood, open grasslands, oak savannahs, Sequoia, and potreros (cattle ranch or pasture) (USFWS 1996). Suitable habitat contains adequate food supply (carrion), open areas, and reliable winds and air movement to allow for long duration soaring during foraging. Flights over vast areas have been measured over several hundred linear miles of travel each day (Meretsky and Snyder 1992). California condors are scavengers of fresh, medium to large-sized carcasses, such as sheep, cattle, deer, and elk (Koford 1952, Snyder and Snyder 2000, Collins et al. 2000). As the largest avian scavengers in North America, they are evolutionarily adapted for feeding on the carcasses of deer, elk, whales, mastodons, and other large (+ 20 kg), dead animals that were often found in the Pleistocene (Emslie1988). Condors are not known to feed on vehicle killed animals (Snyder and Schmitt 2002).

The arc of the southern (central) San Joaquin Valley was the last remaining range of California condors until all were removed for captive breeding. After the turn of the 20th century, they utilized pine and chaparral habitat within what is now the Los Padres, Angeles, and Sequoia National Forests in present day San Luis Obispo, Santa Barbara, Ventura, Los Angeles, and Tulare counties. Foraging habitat included the above, in addition to grassland and oak savannah habitat in Sean Benito, Monterey, San Luis Obispo, Santa Barbara, Ventura, Kern, Tulare and Fresno counties.

Most condors forage within 50 – 70 km of nesting areas, with core foraging areas ranging around 2,500 to 2,800 square km. This wide ranging foraging area appears to be an adaptation to unpredictable food supplies. Most remaining condors in the 1970-1980's were familiar with the primary foraging areas, which comprised an area of 7,000 square km in the foothills of the southern San Joaquin Valley and auxiliary valleys in San Luis Obispo, Santa Barbara, Kern, and Tulare counties (Meretsky and Snyder 1992). After 1982, most visual sightings of foraging occurred in the Elkhorn Hills/Cuyama Valley/Carrizo Plain complex and in the foothills of the southern San Joaquin Valley (Meretsky and Snyder 1992). Telemetry studies and visual observation of California condors pre- and post-nadir show that the birds tended to avoid cities and areas with severe habitat loss or degradation (i.e. residential, commercial, and high intensity agricultural areas). When condors have landed amongst anthropogenically altered environments, (parking lots or buildings), it has been noted that those particular birds have had inappropriate familiarity (imprinting) with humans while in captivity prior to release.

POPULATION STATUS: SUMMARY

California condor populations were apparently in decline at the time of European contact in North America (ca. 400 years BP) (Snyder and Snyder 2000). Since the early 1900's, the condor population was precipitously declining. Early research suggested a population of 60 condors from the 1930-1950's (Robinson 1939, 1940; Koford 1953), though further analysis suggests a more likely population at that time period of 150 individuals (Snyder and Schmitt 2002). Using Koford's early estimate of population size, Miller et al. (1965) suggested that just over 40 birds remained in the early 1960's. Further analysis in the late 1970's showed that the population had declined even further to approximately 30 (Wilbur 1980). Photo-censusing allowed reliable

identification of individuals (Snyder and Johnson 1985), which encouraged a more precise enumeration of the population; (i.e., 21 individuals in 1982, to 19 individuals in 1983, 15 individuals in 1984, and 9 individuals in 1985 (Figure 1, Table 1). The final groups of individuals were removed for captive breeding in 1986 with the last wild California condor captured on April 19, 1987.

Since that time, from January 1992 to the present, California condors have been re-introduced into suitable habitat in eastern Ventura County, generally near the proposed Landmark Village site. (Meretsky et al. 2000). These released birds have attempted to breed at several locations in southern California; the present breeding range includes the Los Padres National Forest; these condors have been observed foraging out onto private land near the Landmark Village project area. Most nesting attempts since the nadir have failed due to embryo mortality, or reproduction has failed when the chicks are approximately 3-5.5 months old (Condor Recovery Program 2006). Current reproductive success of 4 young during 2007 (Grantham 2007) may be predicated by potential mortality as the nesting season progresses.

REGULATORY HISTORY

The California condor was listed as endangered (32 FR 4001) with critical habitat designated (41 FR 41914), except where it has been determined to be a nonessential experimental population (i.e. northern Arizona) (61 FR 54043 54060). The recovery plan for the species was completed April 25, 1996. The designated critical habitat for the California condor does not fall within the boundary of the approved Newhall Ranch Specific Plan, which includes the Landmark Village project area. **Figure 2** depicts the California condor's critical habitat in relation to the boundary of the approved Newhall Ranch Specific Plan.

SURVEY RESULTS

Presence on project area: As opportunistic scavengers, California condors travel up to 225 km per day (Koford 1958, Wilbur 1978, Meretsky and Snyder 1992, Snyder and Snyder 2000, Meretsky and Snyder 1992). California condors are a resident, non-migratory species that have the largest home range of any terrestrial bird in North America (Bloom pers. obs.). The Landmark Village project is approximately 25 miles from the closest known nest, and within the normal flight range of several pair of condors and all of the single, non-mated individuals.

Under most circumstances, condor infrequently fly over valley floor habitats. This is probably because most of valley floor habitat in California has been converted to agriculture or housing. However, condors will fly over (and currently do) fly over the Santa Clarita Valley but will rarely land for roosting or foraging (Bloom pers. obs.). Most condor forage flights are probably at fairly high altitudes above the ground when moving between Hopper National Wildlife Refuge and Newhall Ranch and beyond. For example, only a few condors with transmitters were known to fly across California's Central Valley, but instead followed the foothills and mountains in an arc around the circumference.

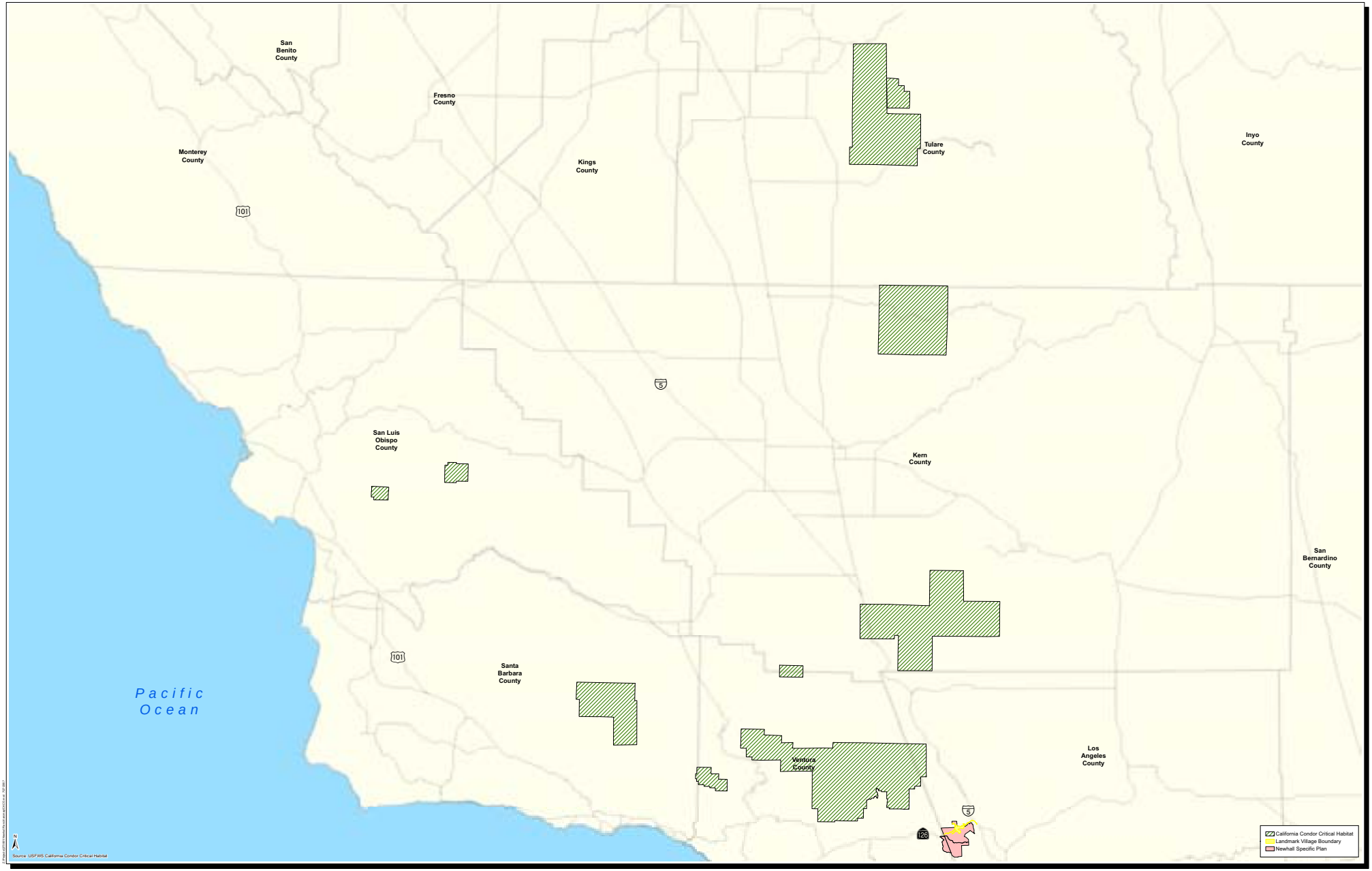
The Landmark Village project area is not currently nesting or roosting habitat and, to my knowledge, no condors are known to have recently landed within the project area (last 25 years).

Landmark Village has no potential for nesting opportunities for California condors. As the population increases, condors may fly more frequently over the Landmark Village project area on their way to foraging opportunities. As seasonal shifts occur, condor movements have been affected during annual periods (Meretsky and Snyder 1992, Stoms et al. 1993). However, in large part because of limited prey and reduced wind and thermals, the Landmark Village project area does not contain the essential elements that define suitable California condor habitat (Snyder and Snyder 2000; Bloom pers. obs.).

It is my determination that while the Landmark Village project area will cause a permanent alteration to the landscape, it will not induce significant direct impacts to the California condor resurging population, specific individuals, their individual and combined behavior, or to their critical habitat.

As indicated above, I predict no direct negative impacts to the California condor as a result of the project. There is a potential for indirect cumulative impacts resulting from an increase in human population, however this potential for indirect impacts is not anticipated to be significant. Landmark Village is a component of the Newhall Ranch Specific Plan. The Specific Plan includes the dedication of the 4,200 acre Newhall Ranch High Country Preserve; an area that has the potential to be utilized in the future by condors due to its habitat characteristics. Additionally, Landmark Village is located along SR 126 at the lower western edge of the Santa Clarita Valley. Due to its elevation and proximity to urban uses it is unlikely that condors would utilize the project site in the future.

LEGEND
Newhall Land Property Boundary
Landmark Village Community Boundary
Project Impact Area
N
Feet
0
2,000
4,000
8,000
Projection: State Plane V, NAD 1983
Aerial Photograph Dated 2006
Kern County
Ventura County
L.A. County
Bloom 2007
Figure 1
LANDMARK VILLAGE
PROJECT IMPACT AREA



Santa Barbara GIS Division
105 East Anapamu
Santa Barbara, Ca 93101
(805)963-0605

Miles
0 10 20

Newhall Ranch Specific Plan Area

California Condor Critical Habitat

Effect of Urbanization on Aquifer Recharge in the Santa Clarita Valley

John Porcello, CH2MHILL, February 22, 2004

Effect of Urbanization on Aquifer Recharge in the Santa Clarita Valley

TO: Tom Worthington/Impact Sciences, Inc.

FROM: John Porcello/CH2M HILL

DATE: February 22, 2004

Introduction

In a groundwater basin, the effect of urbanization on recharge to underlying groundwater is dependent on land uses, water uses, vegetative cover, and geologic conditions. Groundwater recharge from undeveloped lands occurs from precipitation alone, whereas areas that are developed for agricultural or urban land uses receive both precipitation and irrigation of vegetative cover. In an urban area, groundwater recharge occurs directly beneath irrigated lands and in drainages whose bottoms are not paved or cemented. This memorandum discusses the general effects of urbanization on groundwater recharge and the specific effects in the Santa Clarita Valley.

Summary of Findings

In the Santa Clarita Valley, stormwater runoff finds its way to the Santa Clara River and its tributaries, whose channels are predominantly natural and consist of vegetation and coarse-grained sediments (rather than concrete). The stormwater that flows across paved lands in the Santa Clarita Valley is routed to stormwater detention basins and to the river channels, where the porous nature of the sands and gravels forming the streambeds allow for significant infiltration to occur to the underlying groundwater.

Increased urbanization in the Valley has resulted in the irrigation of previously undeveloped lands. The effect of irrigation is to maintain higher soil moisture levels during the summer than would exist if no irrigation were occurring. Consequently, a greater percentage of the fall/winter precipitation recharges groundwater beneath irrigated land parcels than beneath undeveloped land parcels. In addition, urbanization in the Santa Clarita Valley has occurred in part because of the importation of State Water Project (SWP) water, which began in 1980. SWP water use has increased steadily, reaching nearly 44,500 acre-feet (AF) in 2003. Two-thirds of this water is used outdoors, and a portion of this water eventually infiltrates to groundwater. The other one-third is used indoors and is subsequently routed to local water reclamation plants (WRPs) and then to the Santa Clara River (after treatment). A portion of this water flows downstream out of the basin, and a portion infiltrates to groundwater.

Records show that groundwater levels and the amount of groundwater in storage were similar in both the late 1990s and the early 1980s, despite a significant increase in the

urbanized area during these two decades. This long-term stability of groundwater levels is attributed in part to the significant volume of natural recharge that occurs in the streambeds, which do not contain paved, urban land areas. On a long-term historical basis, groundwater pumping volumes have not increased due to urbanization, compared with pumping volumes during the 1950s and 1960s when water was used primarily for agriculture. Also, the importation of SWP water is another process that contributes to recharge in the Valley. In summary, urbanization has been accompanied by long-term stability in pumping and groundwater levels, plus the addition of imported SWP water to the Valley, which together have not reduced recharge to groundwater, nor depleted the amount of groundwater that is in storage within the Valley.

Effect of Pavement on Recharge Beneath Specific Land Parcels

The amount of paved cover on the ground affects the degree to which rainfall and outdoor-applied urban water will be able to infiltrate to groundwater. In heavily industrialized areas with high percentages of paved cover, such as exist in portions of the Los Angeles Basin, less rainfall recharge will occur than if the land is in an undeveloped condition. Furthermore, if the bottoms of rivers and other drainages are paved, then the majority of stormwater generated during a rainfall event will be unable to infiltrate to groundwater. In contrast, the amount of recharge to groundwater will be greater in urbanized areas, such as the Santa Clarita Valley, that have natural soils in the bottoms of rivers and local drainages or that have lower percentages of paved cover on the developed areas lying outside the principal drainages. In these areas, the outdoor use of water for irrigation landscape vegetation or agricultural lands can notably increase the amount of groundwater recharge, particularly if the outdoor water is imported from outside the local groundwater basin. This is discussed further below.

Effect of Vegetative Cover and Water Use

From the 1930s through the 1960s, H.F. Blaney and other researchers at the U.S. Department of Agriculture performed numerous studies to measure the amount of infiltration to groundwater that occurs beneath undeveloped lands and irrigated farmlands, and the differences in recharge rates for different types of native vegetation and crops. In California, these studies included a 1933 study by Blaney in Ventura County, a 1963 study by Blaney and others in the Lompoc Uplands, studies by the U.S. Geological Survey and various consultants in the Montecito and Carpenteria groundwater basins, and a groundwater basin study by Santa Barbara County[1] that incorporated the results of these earlier studies.

Together, these studies concluded that deep percolation to groundwater from undeveloped lands occurs only during years of average or above-average precipitation. This occurs because:

1. Southern California's rainfall is highly seasonal in nature, whereupon most rainfall occurs during the relatively cool period November through March, when plant water

[1] See Santa Barbara County Water Agency, December 15, 1977. *Report on Adequacy of the Groundwater Basins of Santa Barbara County.*

requirements are low, and little, if any, rainfall occurs during the remaining (and warmer months) when plant water requirements increase.

2. During the summer, when little or no rainfall occurs, the native vegetation extracts the residual moisture that is present in the soil, which substantially decreases the soil moisture within the root zone of the vegetation. At the end of the dry season, soil moisture levels on undeveloped lands are below the soil's field capacity, which is the amount of moisture that must be present in the soil before free drainage of water can occur below the rooting zone of the native vegetation.

3. When the seasonal rains arrive, the incident rainfall that is not consumed by plants and does not become stormwater runoff must first raise the soil moisture level to the soil's field capacity before any groundwater recharge will occur. The various studies indicate that about 17 inches/year of rainfall is necessary to raise the soil moisture to the field capacity on an undeveloped parcel of land. This is similar to the average annual rainfall in the Santa Clarita Valley and in other lowland coastal and near-coastal valleys in southern California.

On irrigated lands, irrigation occurs during several months of the year, with the exact duration depending on the amount and timing of rainfall and also the crops or type of urban landscaping being irrigated. The principal effect of converting undeveloped land to land that receives agricultural or urban irrigation is to increase the amount of water that is applied to the land during the low-rainfall months. This application of water to the vegetative cover on the surface of the developed land parcel results in the maintenance of higher soil moisture levels during the warm, dry months than would occur without development. This has three effects:

1. Because irrigation will generally be performed in a manner that maintains the health of the vegetative cover, enough water will be applied to maintain the soil moisture at, or close to, the field capacity of the soil. This in turn will allow some deep percolation to occur from the irrigation water itself.

2. When the rainy season begins, because irrigation has maintained soil moisture at or near field capacity, less of the initial rainfall entering the root zone needs to be stored in the soil (to meet soil moisture deficits) beneath an irrigated parcel than in the case of an undeveloped parcel. Therefore, a greater percentage of the initial rainfall and annual rainfall will be able to infiltrate to groundwater. The southern California studies estimated that irrigated land parcels would allow rainfall infiltration to occur in years when annual rainfall is at least 10.5 inches/year. This threshold rainfall value is 6.5 inches less than the threshold rainfall value that the studies estimated to be necessary for generating groundwater recharge beneath undeveloped land parcels.

3. Because the majority of irrigation occurs during the dry (low-rainfall) months, the total annual recharge to groundwater from irrigated developed lands is the sum of: (a) the deep percolation arising from irrigation (during the low-rainfall months); and (b) rainfall (during the months when less irrigation is occurring). Therefore, groundwater recharge beneath developed lands is greater and occurs for a longer period of time each year than in the case of undeveloped lands where no irrigation is occurring.

Historical Observations of Groundwater Conditions in the Santa Clarita Valley

The findings of the studies described above for other groundwater basins in southern California are consistent with observations that have been made in the Santa Clarita Valley, which are based on long-term water level records, water budget analyses, and groundwater modeling. Based on a month-by-month calibration to a 20-year record of historical water level records (throughout the Valley) and stream gaging records (at the Los Angeles – Ventura County line), the model simulates 10 percent of the applied outdoor water as being available for recharge to groundwater in retail and residential areas, with greater percentages infiltrating beneath golf courses and agricultural lands. This is consistent with a 1980 study by DWR of the groundwater resources of the Santee and El Monte hydrologic subareas of San Diego County. In that study, which was performed to evaluate reclaimed water use plans, DWR concluded that approximately 20 percent of the applied outdoor water in municipal areas infiltrates to the water table, with the remaining 80 percent going to evapotranspiration and direct evaporation. DWR also concluded that there would likely be no significant change in these percentages as urbanization continues.[2]

In the Santa Clarita Valley, as in any urbanized area, urbanization increases the paved area and can increase the magnitude and intensity of stormwater runoff from paved land areas. In the Santa Clarita Valley, this stormwater runoff will find its way to the Santa Clara River and its tributaries, whose channels are predominantly natural and consist of vegetation and coarse-grained sediments (rather than concrete). The stormwater that flows across paved lands in the Santa Clarita Valley is routed to stormwater detention basins and to the river channels, where the porous nature of the sands and gravels forming the streambeds allow for significant infiltration to occur to the underlying groundwater. Consequently, for a developed land parcel, the water that runs off of the paved portion of the land parcel will infiltrate to groundwater from a detention basin or a riverbed, rather than infiltrating onsite.

Riverbed infiltration is a significant percentage of total recharge in the Santa Clarita Valley in any given year. Streamflow records and the model calibration process together demonstrate that year-to-year fluctuations in total recharge in the Valley arise not just from year-to-year variations in incident rainfall within the Valley, but also from year-to-year variations in streamflows in the Santa Clara River and its tributaries. Because the areas contributing flow to the rivers are located both within and outside of the Valley, the recharge that occurs from riverbeds is a significant source of groundwater recharge within the Valley.

Evidence that stormwater infiltration to groundwater is not significantly decreased by urbanization comes from long-term water level records at wells completed in the Alluvial aquifer. These records show that groundwater levels and the amount of groundwater in storage were similar in both the late 1990s and the early 1980s, despite a significant increase in the urbanized area during these two decades. This long-term stability is attributed in part to the significant volume of natural recharge that occurs in the streambeds, which do not contain paved, urban land areas. Also, groundwater pumping volumes have not increased

[2] See State of California, Department of Water Resources, Southern District. August 1984, *San Diego County Cooperative Ground Water Studies: Reclaimed Water Use, Phase II*. Pages 40-41.

due to urbanization, compared with pumping volumes during the 1950s and 1960s when water was used primarily for agriculture. Additionally, beginning in 1980, water was imported into the Santa Clarita Valley from the State Water Project (SWP) for urban use, with SWP water use reaching nearly 30,000 acre-feet per year (AF/yr) by the end of the 1990s, and progressively increasing from about 32,500 AF in 2000 to nearly 44,500 AF in 2003. Because two-thirds of the total urban water demand is used outdoors, a substantial portion of the imported SWP water has been and continues to be applied to urban landscaping, thereby increasing the amount of recharge to groundwater. The remaining urban water is used indoors, and is subsequently routed to local water reclamation plants (WRPs) and then to the Santa Clara River (after treatment). A portion of this water flows downstream out of the basin, and a portion infiltrates to groundwater.

In summary, urbanization has been accompanied by long-term stability in pumping and groundwater levels, plus the addition of imported SWP water to the Valley, which together have not reduced recharge to groundwater, nor depleted the amount of groundwater that is in storage within the Valley.

Recommendations to Help Avoid Significant Fish, Wildlife and Native Plant Resource Impacts for California Environmental Quality Act (CEQA) Projects in Del Norte, Humboldt, Trinity, Siskiyou, Shasta, Tehama, Lassen and Modoc Counties

BY

The Department of Fish and Game
(Northern California-North Coast [Region 1])

These suggestions can help reduce most potential impacts on the following resources to "less than significant" under the CEQA.

Department biologists have relied on scientific research and literature and professional experience to develop the following recommendations to protect the public's fish, wildlife and native plant resources.

It is our understanding that the CEQA process is intended to: (1) identify potentially significant impacts, (2) determine if such impacts can be avoided, (3) describe feasible mitigation for unavoidable impacts and (4) identify the overriding considerations when mitigation is not feasible.

The intent of these suggestions is to promote the second step of avoidance. If avoidance is not possible or if mitigation is required, please contact Department staff to determine if assistance is possible.

RIPARIAN HABITAT

For lead agency planning purposes, most rivers and tributaries should be designated by the Department with the accompanying buffer to provide the required level of protection. For an example, the following map (example 2) has the main and secondary tributaries identified. Solid line streams are main tributaries requiring either a 100-foot minimum buffer or which includes the riparian vegetation plus 50 feet, whichever is greater. Dotted line streams are secondary tributaries requiring either a 50-foot minimum buffer or a buffer which includes the riparian vegetation plus 25 feet, whichever is greater.

Example: Upper Sacramento Valley (urban and rural setting)

<u>From Top of Bank (minimum)</u>	or <u>From Outside edge from existing riparian</u>
150 feet Sacramento River	75 feet
100 feet Main Tributaries	50 feet
50 feet Secondary Tributaries	25 feet

If development restrictions related to mandatory requirements do not allow a project to completely avoid the area of the buffer zone outside the riparian vegetation, the project proponent may average the setback distance along the riparian habitat for the length of the project.

Flood plain - it should be noted that this habitat protection does not compensate for "additional flooding problems" with full buildout in upper watershed. Additional project generated water should be retained and released by use of detention ponds, etc., to mimic natural conditions.

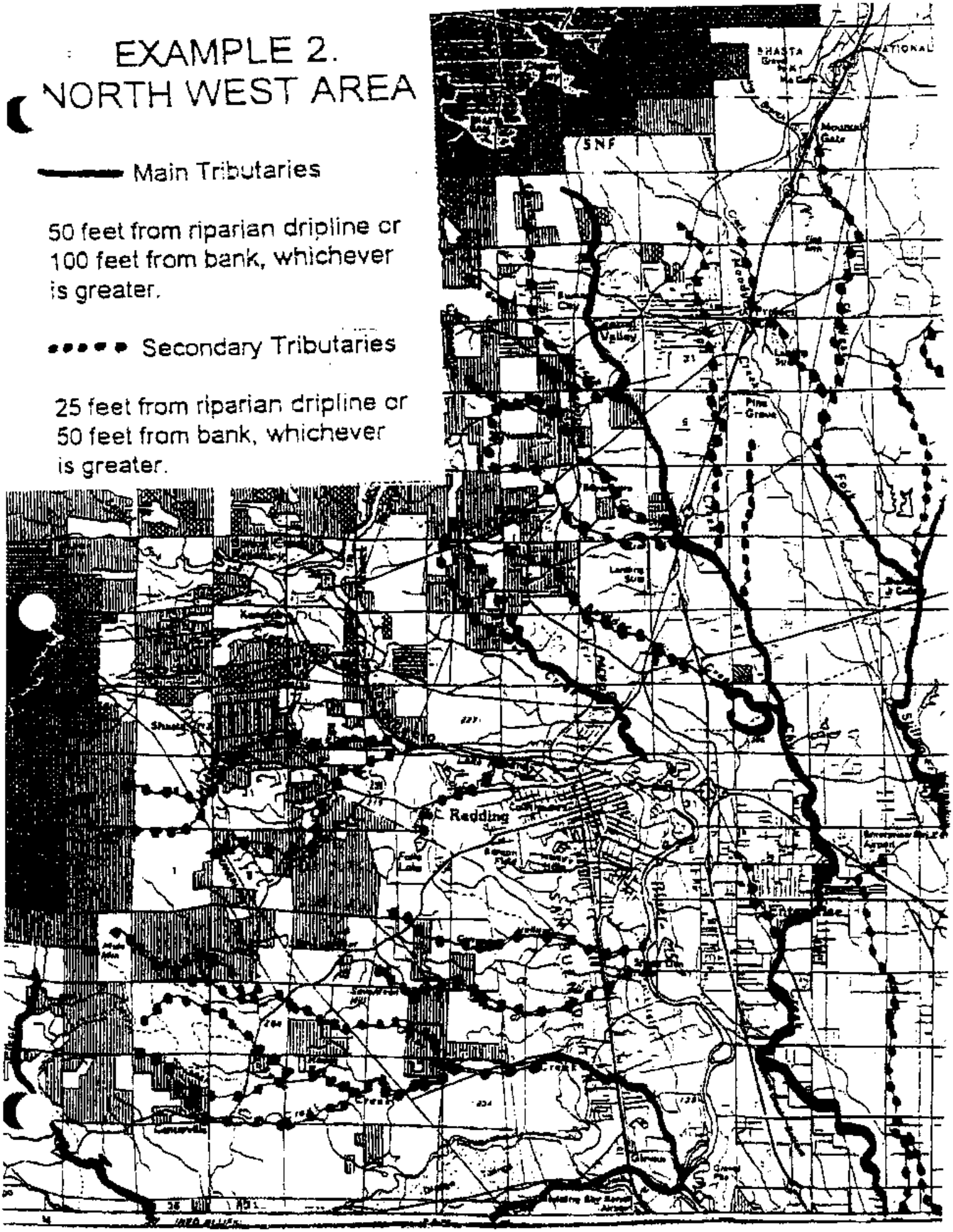
EXAMPLE 2.
NORTH WEST AREA

Main Tributaries

50 feet from riparian dripline or 100 feet from bank, whichever is greater.

Secondary Tributaries

25 feet from riparian dripline or 50 feet from bank, whichever is greater.



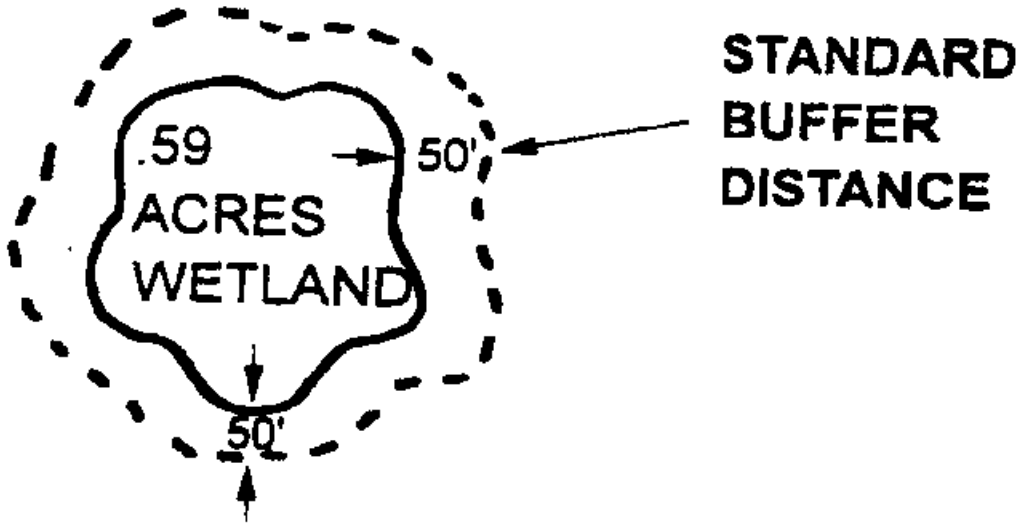
WETLANDS

Wetland Habitats - includes wildlife habitat relationships (WHR) habitat types: wet meadows, fresh emergent wetlands, saline emergent wetlands, riverine, lacustrine, estuarine, and small seeps and springs (Mayer and Laudenslayer 1988). These criteria do not apply to and will not protect vernal pools or dune hollow wetlands. The wetland size should be considered the most important factor for the application of buffers to protect this resource. Wetland buffers are upland areas that surround or lie adjacent to a wetland that assist in reducing potential adverse impacts to wetland functions and values from adjacent disturbance (see example 1).

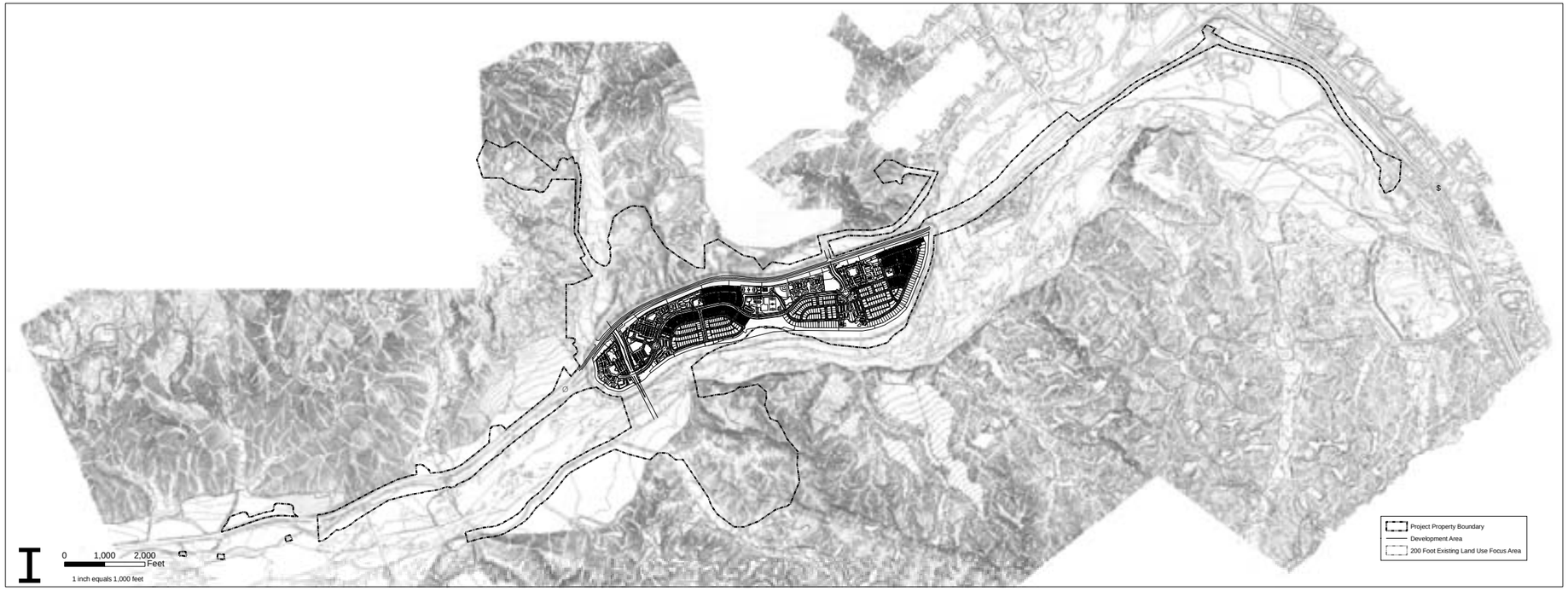
Size of Wetland	Wetland Buffer Needed
0 - 1.0 ACRE	50 FEET
1.1 - 5.0 ACRES	75 FEET
5.1 + ACRES	100 FEET

EXAMPLE 1.

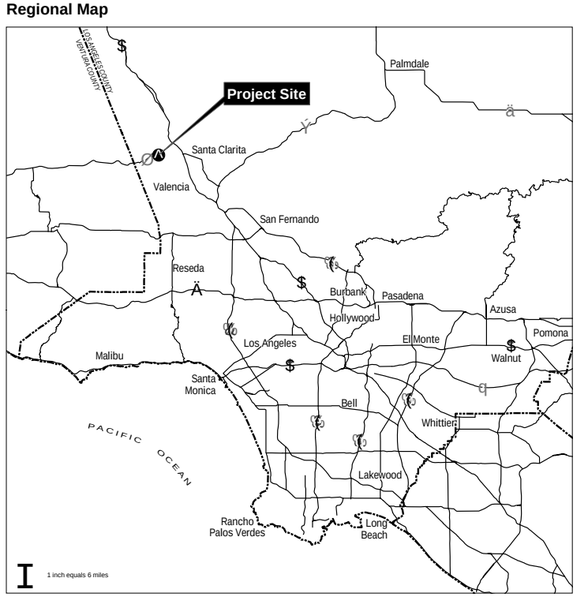
EXAMPLE OF A WETLAND BUFFER



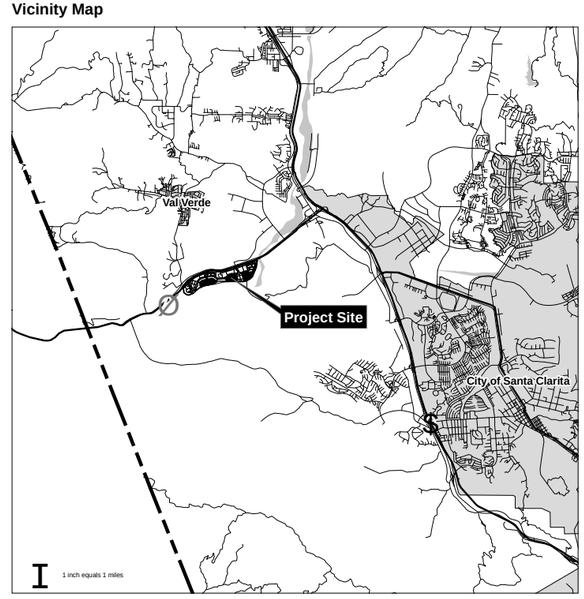
PRELIMINARY FUEL MODIFICATION PLAN
LANDMARK VILLAGE
Tentative Tract Map No. 53108



Regional Map



Vicinity Map



Fuel Modification Zone Distance Calculation Table

Structure Construction			Score
Good/Current Fire Zone 4 or VHFHSZ Requirements		1	
Moderate		5	1
Poor		10	
Fuels			
Primarily Grassland		5	
Coastal Sage Scrub/Oak Woodland		10	10
Chaparral		15	
Slope*	**Down-Slope**	**Up-Slope**	
		0-20 Degrees	1
	0-20 Degrees	20-40 Degrees	2
	20-40 Degrees	40-60 Degrees	4
	40-60 Degrees	60 < Degrees	8
	60 < Degrees		15
** location of required fuel modification*			
Aspect			
North		1	
East		2	8
West		4	
South		8	
Fire Topography			
- Distance from Slope, Chimneys, Saddles, Canyons			
250 - 300		1	
200 - 250		2	
150 - 200		3	5
100 - 150		4	
50 - 100		5	
30 - 50		10	
< 30		15	
Fire History/Potential			
- Historical Fire Patterns/Intensity			
Low		5	5
Moderate		10	
High		15	
Total			**31**
Estimated Fuel Modification Distance**			**100 Ft.**

** Slope distance*

Notes

1. The project is located within the San Francisco Land Grant within Township 4 North, Range 17 West, SBB&M.
2. The project is located within a Very High Fire Hazard Severity Zone (VHFHSZ) based on County of Los Angeles GIS data.
3. The proposed fuel modification zone distance included in this plan was calculated using the County of Los Angeles Fire Department Fuel Modification Plan Guidelines.
4. The subject property abuts Santa Clara River and a planned native habitat restoration area.
5. Proposed fuel modification zone to include public trail behind residential lots (shown on Sheet 2).
6. The proposed fuel modification zone assumes a 15- foot minimum setback from the exposed property edge to all combustible structures.
7. Existing bench located beyond extents of proposed fuel modification line currently managed for agricultural purposes will be re-contoured, introducing an approximate 2:1 slope. The slope will be re-vegetated with coastal sage scrub plant species. This restoration area lies outside the limits of the proposed fuel modification zone.
8. Per Fuel Modification Zone Plan Guidelines issued by the County of Los Angeles Fire Department, "plan review and approval is required for issuance of a building permit(s). Implementation of the fuel modification plan (other than that which will be assigned to the home buyer) is required prior to the issuance of Certificate of Occupancy or building final."
9. Per Fuel Modification Zone Plan Guidelines issued by the County of Los Angeles Fire Department, "the builder/developer is responsible for providing new property owners with recorded CC&R's or disclosure statements identifying the responsibilities for maintaining the fuel modification zone(s) within their property as defined in the approved Fuel Modification Plan. Approved Fuel Modification Plans will be reviewed annually as a part of the brush clearance inspection process, by local fire station personnel, brush clearance office personnel, fire prevention or forestry personnel."
10. The proposed fuel modification zones shall not include plant species listed by the County of Los Angeles Fire Department as 'Undesirable.' Should any of these species (listed below) be already present on site, they shall be removed.

    Chamise – *Adenostoma fasciculatum*
    Red shank – *Adenostoma sparsifolium*
    California sagebrush – *Artemisia californica*
    Common buckwheat – *Eriogonum fasciculatum*
    Pampas grass – *Cortaderia spp.*
    Cypress – *Cupressus spp.*
    Eucalyptus – *Eucalyptus spp.*
    Juniper – *Juniperus spp.*
    Pine – *Pinus spp.*

Project:

LANDMARK VILLAGE

Tentative Tract Map No. 53108

County of Los Angeles, California

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Revisions:

No.	Date	Revision

Date: 05/02/07

Job No. 3738-116

Assoc. Submittal:

Bldg. Dept. Submittal:

Bid Issue:

Construction Issue:

Sheet Title:

Preliminary Fuel Modification Plan

Sheet No.:

1 of 3

PRELIMINARY FUEL MODIFICATION PLAN
LANDMARK VILLAGE
Tentative Tract Map No. 53108

Vegetation Types

Veg Class	Description
AGR	Agriculture
AS	Alluvial Scrub
AWS	Arrowweed Scrub
bCC	Chamise Chaparral
bCHP	Undifferentiated Chaparral
bCSB	California Sagebrush Scrub
bCSB-CHP	California Sagebrush-Undifferentiated Chaparral
BCW	Bulrush-Cattail Wetland
BSS	Big Sagebrush Scrub
BSS-CB	Big Sagebrush Scrub-California Buckwheat
CAM	Cismontane Alkali Marsh
CC	Chamise Chaparral
CC-HCC	Chamise Chaparral-Hoaryleaf Ceanothus Chaparral
CGL	California Annual Grassland
CHP	Undifferentiated Chaparral
CHP-HCC	Undifferentiated Chaparral-Hoaryleaf Ceanothus Chaparral
CSB	California Sagebrush Scrub
CSB-A	California Sagebrush-Artemisia
CSB-BS	California Sagebrush-Black Sage
CSB-CB	California Sagebrush-California Buckwheat
CSB-CHP	California Sagebrush-Undifferentiated Chaparral
CSB-DW	California Sagebrush-Deerweed
CSB-E	California Sagebrush-Encelia
CSB-PS	California Sagebrush-Purple Sage
CWRF	Cottonwood Willow Riparian Forest
CYS	Coyote Brush Scrub
dCSB-PS	California Sagebrush-Purple Sage
dES	Elderberry Scrub
DEV	Developed
DL	Disturbed Land
dMFS	Mulefat
EDS	Eriodictyon Scrub
EFS	Encelia farinosa Scrub
ES	Elderberry Scrub
FWM	Freshwater Marsh
GRG	Giant Reed
HCC	Hoaryleaf Ceanothus Chaparral
HW	Herbaceous Wetland
LOW	Live Oak Woodland
MES	Mexican Elderberry Scrub
MFS	Mulefat
MOW	Mixed Oak Woodland
ORF	Oak Riparian Forest
ORN	Ornamental Vegetation
RW	River Wash
SOC	Scrub Oak Chaparral
SWS	Southern Willow Scrub
TAM	Tamarisk Scrub
VGL	Purple Needlegrass
VOS	Valley Oak Savannah
VOW	Valley Oak Woodland
WW	Walnut Woodland

Project:

LANDMARK VILLAGE

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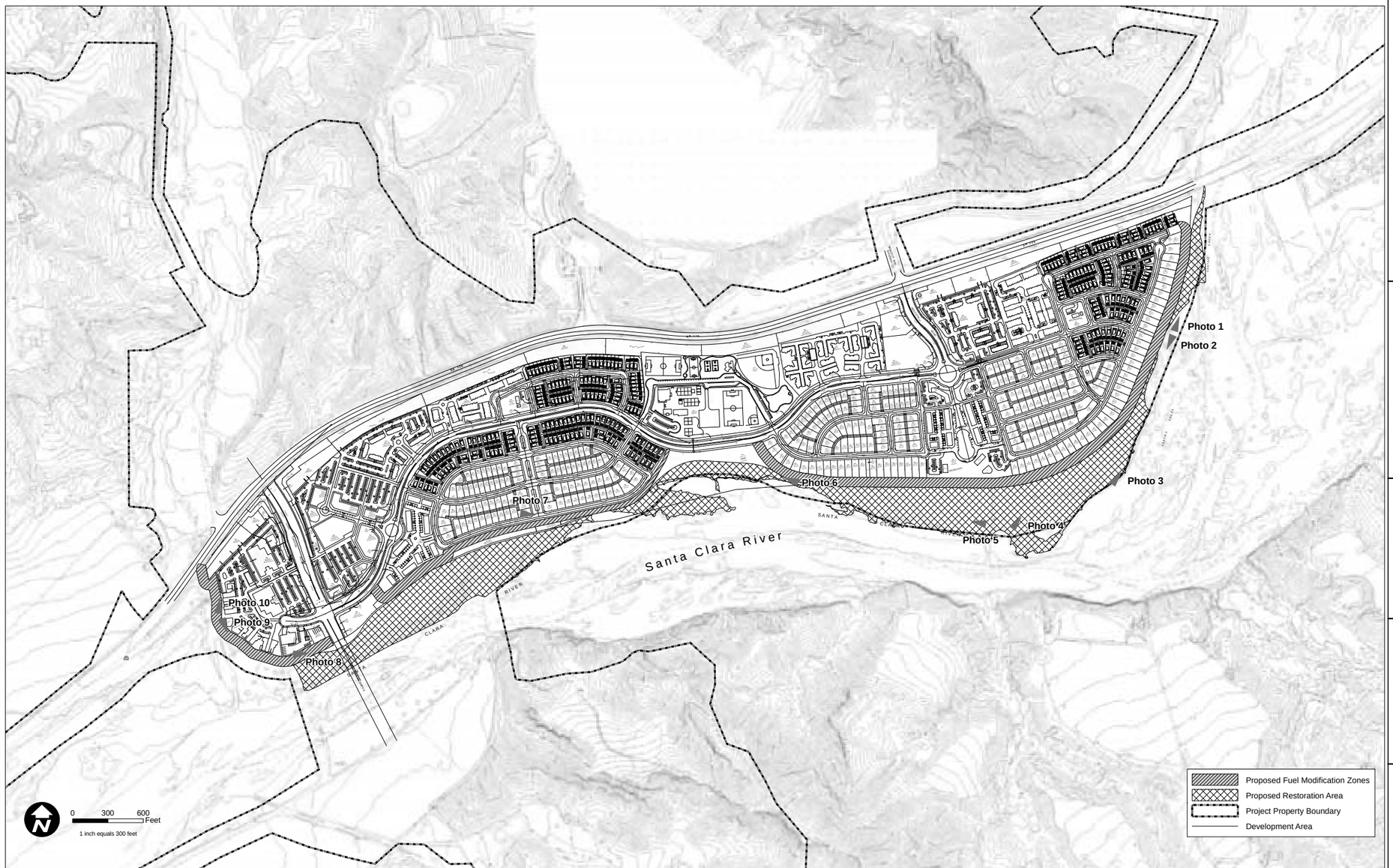
2 of 3

PRELIMINARY FUEL MODIFICATION PLAN
LANDMARK VILLAGE
Tentative Tract Map No. 53108



Site Photographs

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

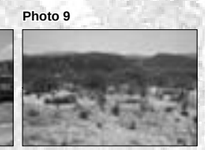


Photo 10

Project:

LANDMARK VILLAGE

Tentative Tract Map No. 53108

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Sheet Title:

Preliminary Fuel Modification Plan

Sheet No.:

3 of 3

Landmark Village Slender Mariposa Lily
Mitigation and Monitoring Plan

Newhall Ranch

DRAFT

JUNE 2007

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June 2007

Landmark Village Slender
Mariposa Lily Mitigation and Monitoring Plan

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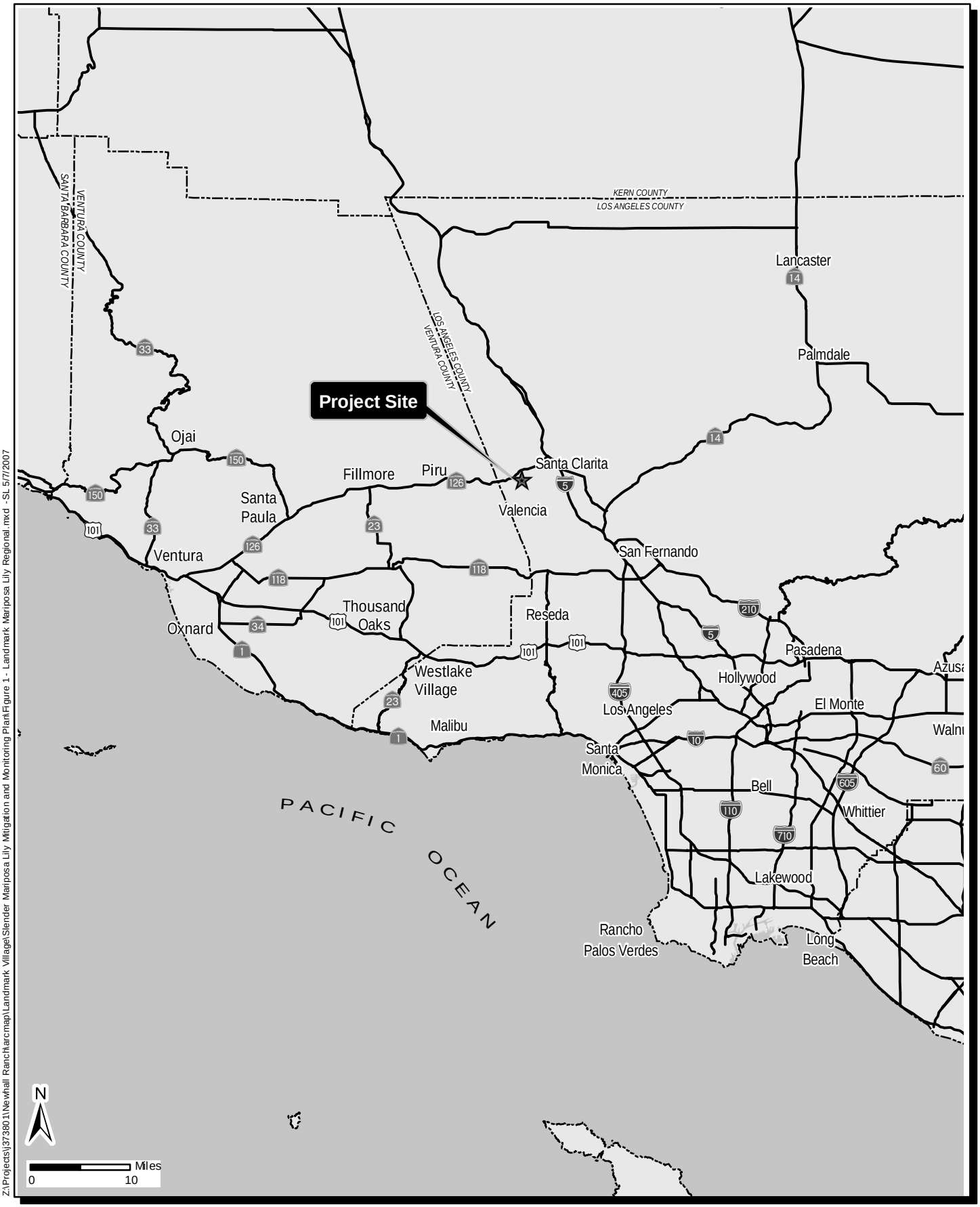
Landmark Village Slender
Mariposa Lily Mitigation and Monitoring Plan

1.0 INTRODUCTION AND PROJECT DESCRIPTION

The report provides Dudek's recommendations for slender mariposa lily (*Calochortus clavatus* var. *gracilis*) mitigation for the Landmark Village project site. The Landmark Village project is generally located south of State Route 126 (SR 126) and is west of Interstate 5 (I-5). The project site is located within the Newhall Ranch Specific Plan area (NSRP), west of the City of Santa Clarita in an unincorporated portion of the County of Los Angeles. The project site is mostly north of the Santa Clara River and west of Castaic Creek (*Figures 1* and *2*).

The proposed Landmark Village project will use buried soil cement to provide bank protection/stabilization along a segment of the Santa Clara River to accommodate development of the adjacent land for a mixed-use development, including construction of a multi-use recreational trail, school, and park. Implementation of the proposed project will result in impacts to approximately 471 slender mariposa lily plants located in the Adobe Canyon borrow site, the Chiquito Canyon grading site, the Valencia Commerce Center water tank site, and the reclaimed water tank sites in Chiquito Canyon. Proposed Mitigation Measure 4.4-5 of the Landmark Village Final EIR presently states that:

> *The Draft Landmark Village Slender Mariposa Lily Mitigation and Monitoring Plan* (see **Appendix 4.4**) shall be implemented by the applicant. The plan incorporates the findings of the *Draft Newhall Ranch Mitigation Feasibility Study* (Dudek & Associates 2007; see **Appendix 4.4**). The plan demonstrates the feasibility of replacing the number of individual plants to be removed at a 1:1 ratio and/or enhancing and protecting existing populations of the species. The plan specifies, at a minimum, the following: (1) the location of mitigation sites in protected/preserved areas within the Newhall Ranch Specific Plan area; (2) methods for harvesting seeds and salvaging and transplantation of individual bulbs/plants to be impacted; (3) site preparation procedures for the mitigation site; (4) a schedule and action plan to maintain and monitor the mitigation area; (5) a list of criteria and performance standards by which to measure success of the mitigation site; (6) measures to exclude unauthorized entry into the mitigation areas; and (7) contingency measures in the event that mitigation efforts are not successful. The plan shall be subject to the approval of the County prior to the issuance of a grading permit (County of Los Angeles 2007).



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DUDEK

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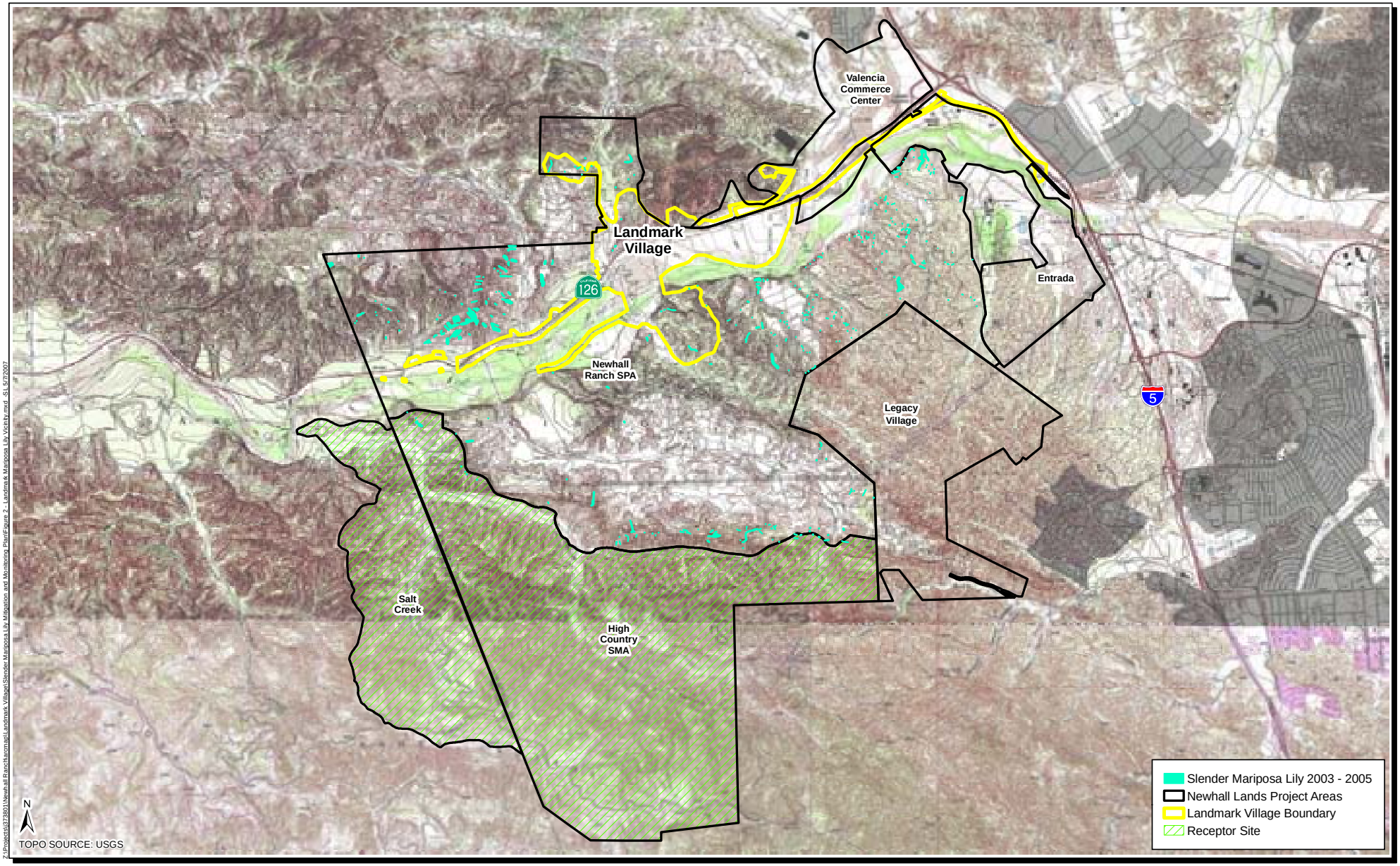
Landmark Village Slender Mariposa Lily
Mitigation and Monitoring Plan

Regional Map

FIGURE
1



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DUDEK

621 Chapala St
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0 1 2 Miles

Landmark Village Slender Mariposa Lily
Mitigation and Monitoring Plan

Vicinity Map

FIGURE 2

Proposed mitigation for direct impacts to slender mariposa lily will include salvage and translocation of individuals identified within the disturbance areas (*Figure 3*) to an appropriate receptor site within the High Country Special Management Area (SMA) or the Salt Creek Area where they can be preserved in perpetuity (see *Figure 2*). A mitigation ratio of 1:1 is required by the County of Los Angeles (County) and will be met through direct salvage and planting of mature bulbs and sowing of salvaged seed. This plan meets the requirements of the above-proposed mitigation measure and provides the recommended guidelines for proposed slender mariposa lily mitigation.

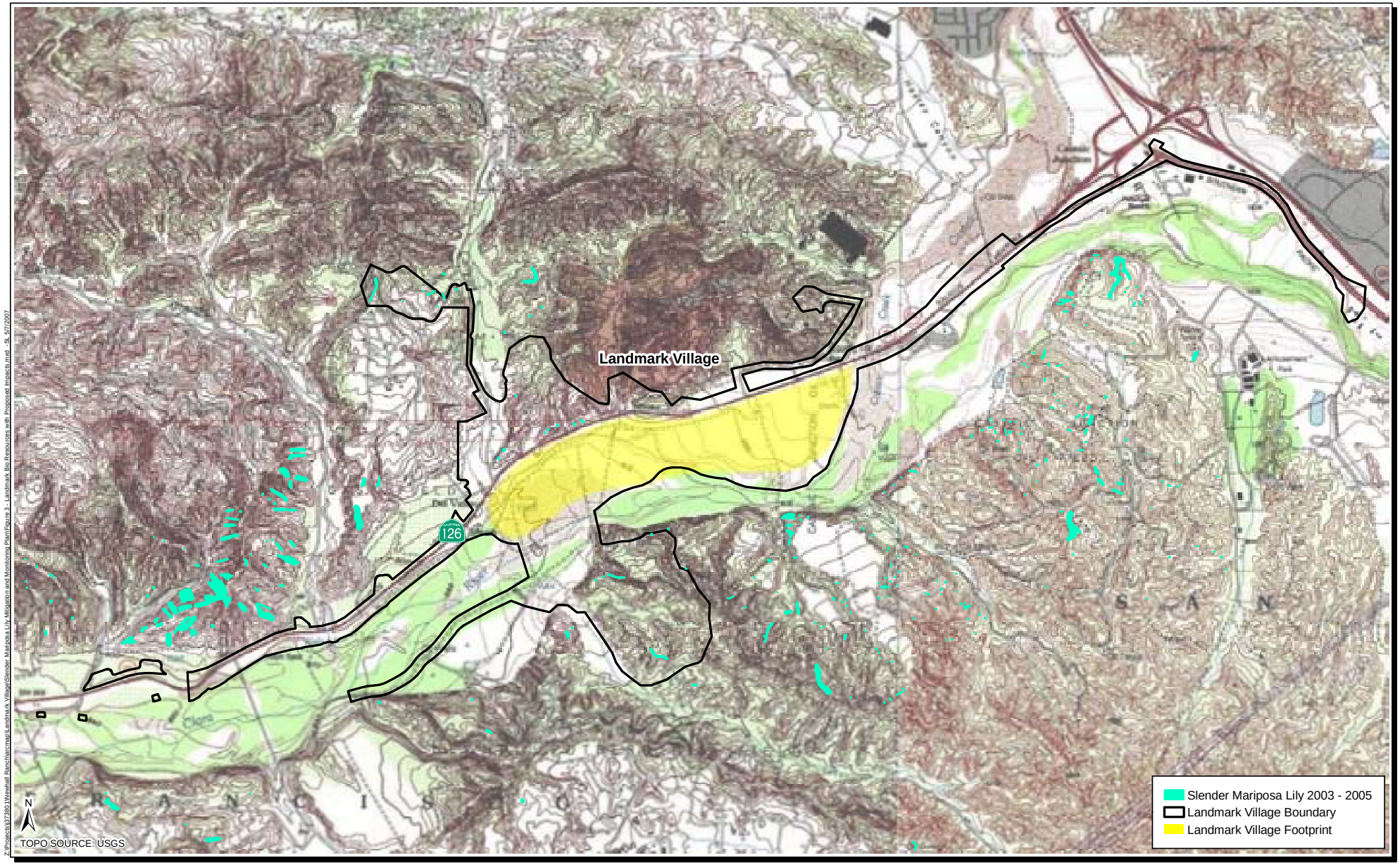
2.0 DESCRIPTION OF THE TRANSPLANTATION PROGRAM

2.1 Transplantation Program Goals

The slender mariposa lily transplantation program outlined herein is focused on salvaging and relocating the on-site population of slender mariposa lily that would otherwise be impacted by the proposed project. The goal of the transplantation program is to successfully relocate the known portion of the existing slender mariposa lily population to an appropriate/compatible off-site receptor site adjacent to an existing population, where it can successfully exist and can be afforded protection in perpetuity. It is not the goal of this transplantation program to create specific plant communities but rather to establish new subpopulations of slender mariposa lily within the High Country SMA or Salt Creek Area adjacent to or near existing slender mariposa lily populations.

2.2 Preliminary Schedule for Implementation

Initial clearing and grubbing and/or grading operations are planned for the project site as early as the spring of 2008. Should fewer bulbs be identified and flagged than necessary and conditions in the field allow, Dudek proposes that Newhall Land take actions to help identify and salvage bulbs more completely, including supplemental irrigation and soil salvaging from the impacted sites. Supplemental irrigation would be administered should prolonged periods without rainfall occur during the growing season. Soil salvaging would include salvaging the top 8 to 12 inches of soil from impacted sites after known bulbs have been removed, searching for bulbs and spreading over appropriate receptor sites at a depth of 6 to 8 inches to help increase the number of bulbs transplanted.



Z:\Projects\37380 Newhall Ranch\Landmark Village\Slender Mariposa Lily Mitigation and Monitoring Plan\Figure 3 - Landmark Bio Resources with Proposed Impacts.mxd - SL 5/7/2007

DUDEK

621 Chapala St
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0 0.5 1 Miles

Landmark Village Slender Mariposa Lily
Mitigation and Monitoring Plan

Biological Resources with Proposed Impacts

FIGURE
3

Timing of the site preparation, salvaging, and transplantation work will be determined based upon seasonal weather constraints and timing of scheduled project grading. Transplantation of slender mariposa lily bulbs should occur when the plants are dormant during the summer or early fall. To take advantage of potential seasonal rains, December of any given year will be the latest appropriate month for transplantation activities to occur. Transplantation work for this project is anticipated for the fall of 2008 (October–November). If the project becomes delayed for any reason, resulting in delays in salvaging beyond December, then the entire transplantation program would need to be rescheduled for the following year. The anticipated schedule for implementation includes:

Mitigation Activity	Approximate Activity Date
Flagging existing lily plants at Landmark Village and receptor site	Spring of 2008
Seed collection	Summer of 2008
Bulb excavation	Late summer or fall of 2008
Receptor site preparation and installation of bulbs and seed	Late fall or early winter of 2008

2.3 Time Frame for Success

Success will be defined by the ability of the transplanted slender mariposa lily subpopulations to persist during the long-term maintenance and monitoring period, and to demonstrate at least a 1:1 ratio of growth (vegetative evidence) of the salvaged and relocated subpopulations to the number of individuals removed during any 1 of the last 3 years of the total 5-year program (i.e., at least 471 slender mariposa lily individuals will have leafed out in any 1 of the last 3 years during the long-term maintenance and monitoring program). Thus, if success criteria are met during years 3 through 5, then early release of the project may be possible with concurrence from the County. A reference on-site population of naturally-occurring slender mariposa lily near the mitigation site will be used to compare against the transplanted subpopulation in order to determine whether or not there have been appropriate seasonal conditions (i.e., temperature and rainfall) to induce vegetative growth and flowering. The inclusion of seeding may also contribute to the completion of the success criteria if additional individuals grow and mature or become established from seed.

2.4 Rationale for Expecting Transplantation Success

As previously described, the proposed slender mariposa lily receptor sites will be located within the High Country SMA or Salt Creek Area and will be adjacent to or near existing populations of slender mariposa lily that have been preserved. The close proximity of the proposed receptor sites to a natural population with appropriate soils, hydrology, elevation, and slope exposure will

help ensure that the transplanted individuals experience the same environmental conditions in which the natural population presently exists. The physical and chemical similarities of the sites increase the probability for success of the transplantation program.

Dudek's previous work with salvaging, transplanting, and establishing *Calochortus* (both *Calochortus clavatus* var. *gracilis* and *Calochortus plummerae*) at another Newhall Land project, RiverVillage, indicates that similarly successful, if not improved, results can be anticipated at Landmark Village by following similar procedures. In the autumn of 2005, seed and 687 bulbs were salvaged from the RiverVillage footprint and transplanted into selected sites in similar habitat nearby in late 2005 and early 2006 (Dudek 2006b). Unfortunately, rainfall totals since transplantation have been well below normal. The salvaged population received some supplemental hand-watering during the *Calochortus* "growing season," to assist in growth. Consequently, approximately 60% of the salvaged bulbs grew in 2006 and, in 2007, 32% grew (including bulbs and second-year seedlings), with an additional approximately 200 bulbs growing with the plots that could not be definitively identified because they were too small or had dried up before identification was possible (Dudek 2007a, 2007b). Although this represents a decline in identifiable *Calochortus* individuals from 2006 to 2007, the cause is likely the record-low rainfall in the region, and it is anticipated that many of the individuals that did not grow in 2007 will grow in 2008 (if precipitation improves). In comparison, during the years since transplantation, low rainfall totals have resulted in the growth of almost no naturally-occurring *Calochortus*.

2.5 Backup Contingency Measures

In the event that the initial transplantation effort is not successful and the success criteria have not been met, then backup contingency measures will be implemented. If at any point after the first year of the 5-year monitoring period it is determined that the quantity of transplanted slender mariposa lily individuals from the project area is not enough to meet the minimum mitigation requirement, slender mariposa lily will be grown from seed at a native plant nursery. The seed source for propagation will be from seed that was collected from individuals within the project site prior to bulb salvage and stored at a nursery. If the seed source from individuals from the project site is exhausted, slender mariposa lily seed will be harvested from individuals within the preserve area in the High Country SMA. The project biologist for this project will coordinate with the native plant nursery personnel to ensure proper propagation of the seed. When the condition of the propagated slender mariposa lily plants is considered satisfactory by the project biologist and the nursery staff, and the additional number of slender mariposa lily bulbs have been obtained, then they will be transferred to the receptor sites and planted during the appropriate fall season of any given year during the five-year maintenance and monitoring

period. Also, if during the 5-year monitoring period rainfall is significantly below average during the growing season for slender mariposa lily (as determined by the project biologist), supplemental water may be supplied to the receptor site in order to help sustain the population and mimic average rainfall conditions. These measures will continue during the maintenance and monitoring period until the performance criteria are met.

3.0 DONOR AND RECEPTOR SITE DESCRIPTIONS

3.1 Slender Mariposa Lily Donor Site

The donor site is considered the area where slender mariposa lily occurs within the impact footprint of the proposed development (*Figure 3*). Slender mariposa lily occurs in the project site on slopes and ridgelines in native California sagebrush scrub in the Adobe Canyon borrow site, the Chiquito Canyon grading site, the Valencia Commerce Center water tank site, and the reclaimed water tank sites in Chiquito Canyon.

During surveys for special-status plants conducted in 2002, 2003, 2004, 2005, 2006, and ongoing surveys slender mariposa lily were found on site and mapped (Dudek 2002, 2004a, 2004b, 2005 and 2006a). 471 individuals have been documented on site during these botanical surveys representing an unknown percentage of the total population on site. The number of individuals of this species detected varies every year due to natural population phenology (i.e., natural population increase and decrease cycles and their reliance on rainfall to bloom).

3.2 Slender Mariposa Lily Receptor Site

The receptor sites will be located within the High Country SMA, south of the Landmark Village project, within the Newhall Ranch Specific Plan area, and within the Salt Creek Area. The High Country SMA is located in Los Angeles County along the border with Ventura County and west of the City of Santa Clarita. The Salt Creek Area is located adjacent to the High Country SMA, within Ventura County. Environmental conditions at the receptor site are appropriate for slender mariposa lily, evidenced by the fact that this species naturally occurs at this location.

All transplanted bulbs and seed will be located within suitable habitat for slender mariposa lily adjacent to or near existing populations of slender mariposa lily at the yet-determined receptor sites in the High County SMA and Salt Creek Area (see *Figure 2*). General transplanting areas will be designated by the fall before the transplanting year so that existing slender mariposa lily individuals can be located and marked. Specific planting locations will be determined in the field

by the project biologist. The existing slender mariposa lily locations and the previously-transplanted lily locations near or adjacent to the proposed receptor sites will be clearly marked in the field prior to transplantation activities so they are not impacted by the transplantation process. The installation sites will be marked with stakes and recorded by a global positioning system (GPS) in the field to facilitate relocation during the monitoring period. The receptor site will be protected and will remain as open space in perpetuity.

4.0 IMPLEMENTATION PLAN

4.1 Site Preparation

Site preparation will begin in the fall of the transplanting year. Site preparation activities are detailed below.

- The area where slender mariposa lily is known to occur on site will be avoided during the initial clearing and grubbing and/or grading operations for the development project. This area will be marked in the field and fenced with temporary construction fencing until the slender mariposa lily plants can be removed from the site.
- Slender mariposa lily plants will be marked in the field, both at the donor site and the receptor site, during the blooming period in the spring prior to the year of transplanting, which is estimated to be during April and/or May. At the donor site, all individual slender mariposa lily locations will be marked with a pin flag. Additionally, a small strip of flagging tape will be tied to the base of the stem of each individual to facilitate relocation for salvaging after the plants have gone dormant. At the receptor site, areas where individuals and/or groups of individuals occur will be flagged so that they can be avoided during transplantation activities.
- In order to ensure that the individuals occurring within the project site bloom in the following spring (so that their specific locations can be marked in the field for salvaging purposes), supplemental water may be recommended and applied to the area during extended periods (e.g., greater than approximately 1 month) without significant precipitation during the critical portion of the growing period for this species.
- Planting plots will be designated at the receptor site. The project biologist will determine appropriate planting locations within the receptor site based on biological conditions important to the survival of the transplanted individuals (e.g., soils, slope, and aspect) and on the existing locations of slender mariposa lily. The plots will be established within small openings in the existing habitat.

- Prior to salvaging the slender mariposa lily bulbs at the donor site, seeds will be collected from flagged individuals once the seed has matured, but prior to the seed capsules opening to disperse the seed. Seed will be stored in breathable paper bags in a cool, dry, and dark place until it can be planted at the receptor site.
- Following flagging of the slender mariposa lily plants and after the plants have gone dormant, invasive weed control efforts within the receptor site will begin. Any non-native plant species that are potentially invasive and/or pose a threat to the establishment, development, or persistence of slender mariposa lily will be controlled.
- All equipment maintenance, staging, dispensing of fuel or oil, or any other such activities will occur in designated upland areas identified within the impact footprint of the project.

4.2 Salvaging and Planting Program

The following general methods are proposed for the salvaging and transplantation of slender mariposa lily:

- Slender mariposa lily bulbs will be salvaged from known locations within the project limits of grading. A backhoe, digging spade, or shovel will be used to salvage bulbs, depending on access constraints and the number of individuals at each particular location.
- Depending on site conditions and the number of bulbs located and flagged during the spring it is possible that soil salvaging would help to locate all possible bulbs in the impacted areas. During soil salvaging, the top 8 to 12 inches of soil could be removed, searched for bulbs, and then spread 6 to 8 inches deep at appropriate locations within the receptor site. An attempt will be made during bulb salvage to collect the bulbs with their surrounding soil and associated biomass intact. Due to the soil type found on site, the soil may not stay consolidated as a solid mass. If soil masses will not stay consolidated, the bulbs will be separated from the soil and stored in appropriate storage conditions until planted at the receptor site.
- After the bulbs have been removed from the donor sites, a crew of laborers will sort through the remaining disturbed soil to locate any remaining bulbs exposed during salvaging.
- If fewer bulbs are salvaged than the 471 found in previous years, the resulting deficit can be eliminated by using previously-collected seed from impacted slender mariposa lily plants.
- Salvaged bulbs will be planted at the receptor site in plots. The plots will measure approximately 2 feet by 2 feet. Nine salvaged bulbs will be placed in each plot, arranged

in a grid pattern to facilitate monitoring. The plots will be distributed in natural openings in the habitat at the receptor site.

- Bulbs will be planted at a depth of approximately 2 to 6 inches (depending on the size of the bulb). Bulbs will be oriented correctly (roots down, stem up) in the soil during planting.
- Salvaged seeds will be planted in plots at the receptor site. Seeding will be prepared by scarifying the soil to approximately 1 inch in depth and sowing the seed at one-quarter to one-half inch in depth. The soil scarification will be done by small rototiller, shovel, and/or rake, and the seeding will be done by hand.
- Herbivore-exclusion fencing will be installed surrounding all planting plots. Herbivore-exclusion fencing shall be constructed of poultry netting (or similar) and will be installed at least 18 inches below ground surface and will extend to approximately 30 inches above ground level. Herbivore-exclusion fencing will also be installed to cover the top of each plot.
- Permanent markers will be installed at each plot at the slender mariposa lily receptor site locations to specifically identify the transplanted slender mariposa lily locations during the 5-year long-term maintenance and monitoring period. The markers will consist of 2-inch by 2-inch by 24-inch wooden survey hub stakes driven into the ground next to each plot. The plots will also be marked with a GPS after planting to facilitate relocating the plots for monitoring in subsequent years.
- If slender mariposa lily bulbs are detected during the excavation of receptor sites, they will be planted back into the receptor sites at the appropriate soil depth during the transplantation process.
- Receptor sites will be watered in to prevent the formation of cracks and air pockets. During a follow-up site visit approximately 1 week after the initial planting period, additional native soil will be spread to fill in gaps or depressions that form after the soil has settled and the area will be watered in a second time.
- If seasonal rains are inadequate to keep the soils moist through the first growing season, supplemental irrigation will be supplied to the receptor sites. Supplemental irrigation will be conducted on an as-needed basis approximately every 1 to 3 weeks during the initial growing season, depending on natural rainfall, temperatures, and day length.

4.3 As-Built Conditions

The GPS locations of each plot within the receptor area will be overlaid on an aerial image of the site to document the final "as-built" transplantation plot layouts. The product will be considered the "as-built plan." The County will receive copies of this "as-built plan" as part of the initial completion report. The "as-built plan" will also serve as a permanent record that will be used for reporting and management purposes during long-term biological monitoring.

5.0 MAINTENANCE PLAN DURING 5-YEAR MONITORING PERIOD

Because the goal of the transplantation program is primarily to sustain the transplanted subpopulations of slender mariposa lily on site, the primary effort of the maintenance program will be concentrated in the first season of growth to help offset the negative effects of the site disturbance, non-native weed competition, and exotic invasive plant competition at the slender mariposa lily receptor sites. Subsequent seasons should require less intensive maintenance as the vegetation reaches a state of equilibrium, but persistent weed control of invasive exotic weeds will likely be required. Maintenance issues are described in more detail below.

Weed Control: Weed control within the slender mariposa lily receptor sites should be conducted on a regular basis during the long-term maintenance and monitoring period. Maintenance should be conducted monthly during the growing season (November to May) of the first year and quarterly thereafter until the end of the 5-year maintenance and monitoring period. Weed growth and prevalence shall be assessed by the biological monitor and remedial weeding shall be directed as necessary based on seasonal conditions.

Target non-native species selected for control in this plan include those non-native plant species that are potentially invasive and/or pose a threat to the establishment, development, or persistence of slender mariposa lily. The primary target species shall be those identified and listed by the California Invasive Plant Council (Cal-IPC, formerly the California Exotic Pest Plant Council, CalEPPC) in *Exotic Pest Plants of Greatest Ecological Concern in California* (California Exotic Pest Plant Council 1999). A revised version of the *California Invasive Plant Inventory* has recently been completed and is available online (California Invasive Plant Council 2006).

Measures to control exotic invasive plant species will consist of the complete removal of selected non-native vegetation (i.e., seed heads, stems, roots). All debris and slash generated from the weed-removal activities will be disposed of off site in a legally acceptable manner.

Weed-control measures will include the following: **(1)** hand-removal, **(2)** mechanical removal (e.g., cutting with weed whip machines, hoeing), and **(3)** herbicide application. The method of weed control shall be based on the most effective method for the species being targeted and the stage of plant development. In general, hand-removal of weeds is the preferred method of control, with other methods implemented as necessary. Weeds shall be controlled when plants are young (i.e., 6 to 10 inches tall) and prior to the formation of seed heads. The maintenance contractor should coordinate with the preserve manager and/or the project biologist to identify specific locations within the site where chemical herbicide treatments would be acceptable. All herbicide treatments must be specified by a licensed pest control advisor and applied under the direction of a licensed pest control applicator.

Fencing: The maintenance contractor will ensure that all herbivore-exclusion fencing remains in place and is effectively protecting the subpopulations of slender mariposa lily from disturbance.

Seeding: Supplemental seeding may be recommended by the project biologist to prevent potential erosion and encourage native species establishment, as necessary. If seeding is recommended, an appropriate native seed mix will be specified by the project biologist, composed of the following proposed plant species:

California brickellbush (*Brickellia californica*)
California brome (*Bromus carinatus*)
California buckwheat (*Eriogonum fasciculatum*)
California encelia (*Encelia californica*)
California poppy (*Eschscholzia californica*)
California sagebrush (*Artemisia californica*)
Common goldfields (*Lasthenia californica*)
Deerweed (*Lotus scoparius*)
Foothill needlegrass (*Nassella lepida*)
Miniature lupine (*Lupinus bicolor*)
Purple needlegrass (*Nassella pulchra*)
Tidy-tips (*Layia platyglossa*)

Trash and Debris: All non-organic trash and debris shall be removed from the site on a regular basis during maintenance visits.

Erosion Control: The site shall be monitored for erosion problems and measures taken, as necessary, to help prevent erosion within all plot locations and within all seeded areas.

Access Control: The preserve area shall be checked regularly during scheduled maintenance visits for evidence of human disturbance, including off-road vehicle use, illegal dumping, vandalism, pedestrian access, and unauthorized brush clearing.

Supplemental Irrigation: The soils at the transplantation areas shall be monitored for moisture during the growing season. If soil moisture levels appear inadequate to support slender mariposa lily during the growing period, particularly during the first 2 years of the 5-year maintenance and monitoring period, the project biologist and Newhall Land shall be notified. Supplemental irrigation shall be supplied to the transplanted slender mariposa lily plants if recommended by the project biologist in coordination with Newhall Land.

6.0 MONITORING PLAN DURING 5-YEAR PERIOD

Biological monitoring of the transplanted slender mariposa lily plants during the 5-year maintenance and monitoring period will measure the establishment of the slender mariposa lily and evidence of species health and proliferation. Field-collected data will provide a quantitative measure of the survival and establishment of the slender mariposa lily subpopulations and flowering/seed production each year. Monitoring will likely rely on observations of flowering individuals, which are easier to locate and identify than non-flowering individuals. However, because the flowering of this species is so variable from year to year, monitoring will also include observations of vegetative growth (leafing out). Monitoring will occur in the spring of each year during the growing season and while the slender mariposa lily is in bloom. Additional monitoring at the site will occur periodically throughout the year to determine the need for maintenance to protect the transplanted slender mariposa lily plants from weed invasion or other disturbances.

6.1 Receptor Site Monitoring Methods and Schedule

Biological monitoring will be conducted by the project biologist to determine the status of the slender mariposa lily transplants, through periodic monitoring and collection of quantitative data, and the need for any remedial measures. This work will include a quantitative biological assessment each year (may require multiple visits), to be timed during the growing season and with the flowering of slender mariposa lily, and three qualitative assessments each year to assess overall site conditions and maintenance activities (*Table 1*).

TABLE 1
RECEPTOR SITE MONITORING SCHEDULE

		Status/ Completed																							
		Yr. 0 (2008)				Yr. 1 (2009)				Yr. 2 (2010)				Yr. 3 (2011)				Yr. 4 (2012)				Yr. 5 (2013)			
		Quarter				Quarter				Quarter				Quarter				Quarter				Quarter			
Phase	Task Description	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Salvaging & Transplantation Phase	Flag existing slender mariposa lily plants		X																						
	Salvage slender mariposa lily bulbs				X																				
	Transplant slender mariposa lily bulbs				X																				
	Install protective fencing				X																				
	Prepare final map & installation completion report				X																				
Maintenance Phase	Weed control – Monthly during growing season of the first year, quarterly thereafter				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Monitoring Phase	Biological monitoring/data collection				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Site Protection	Verify fencing & make repairs				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Reporting	Prepare year-end reports								X				X				X				X				X
Remedial Measures	To be determined each year and at end of monitoring period								X				X				X				X				X
Final Sign-Off**	County to verify site conditions																								X

Note: Schedule assumes initiation of salvaging and transplantation in the fall of 2008, with 5 years of monitoring through the fall of 2013 and final sign-off in the spring or fall of 2013. This schedule could change if the project is delayed.

** The actual date/timing for final sign-off by the County will be based upon actual achievement of success criteria.

The purposes of the monitoring visits will be to document weed problems, site security and maintenance issues, and the growth, flowering, and seed production of slender mariposa lily within the receptor sites. At each monitoring visit, the following measurements and observations will be made, as applicable.

- ***Observation of evidence of vegetative growth.*** Floral structures are needed to conclusively verify that the presumed vegetative growth is in fact slender mariposa lily. However, experienced biologists can often identify mariposa lily in general from vegetative growth only, particularly if the individual planting locations are known. Observation of vegetative growth is better accomplished in the winter or early spring, before leaf shoots begin to senesce. After successive years of monitoring and with

knowledge of the known locations of planted slender mariposa lily, it will be possible to estimate the number of individuals present by examining vegetative growth.

- ***Observation of flowering and seed production***. All flowering individuals observed within the transplantation receptor areas will be counted. Biological monitoring during the blooming period may require multiple visits because there is often an extended blooming period (several weeks) during which time flowering is staggered (i.e., some individuals may have open flowers and be easily detected, while other individuals may have closed flowers or flowers in bud and go undetected). Additionally, the peak blooming period varies from year to year; therefore, multiple visits will aid in capturing a more accurate estimate of flowering individuals. All flowering individuals detected during the monitoring periods will be recorded on data sheets.

  In addition to monitoring the transplanted subpopulations, reference site monitoring will be conducted in the adjacent or nearby undisturbed slender mariposa lily populations. A fixed area (reference site) will be demarcated, wherein all flowering individuals detected will be counted during the annual data collection period to provide comparison data. This will provide consistent, year-to-year data on a discrete portion of the existing population, which will be useful for statistical purposes.

- ***Photo documentation.*** Representative photographs will be taken from fixed points within the transplantation areas as well as the reference site, including overall and close-up views, from fixed viewpoints, and from representative plots allowing year-by-year comparison during the monitoring period.

- ***Monitor soil moisture and rainfall patterns.*** Recent rainfall patterns and weather forecasts will be researched and soil moisture levels on site will be evaluated to determine if supplemental irrigation is necessary. If it is determined that precipitation during the growing period has been inadequate to support the transplanted slender mariposa lily, particularly during the first 2 years of the 5-year maintenance and monitoring period, supplemental irrigation may be recommended, as determined by the project biologist in coordination with Newhall Land.

- ***General preserve monitoring.*** Observations will be made of the general status of fencing, signage, perimeter control (trespass), erosion control, litter, and weeds.

6.2 Annual Reports

An annual monitoring report will be prepared in the fall/winter each year of the 5-year maintenance and monitoring period, summarizing the information collected during the yearly site visits. Data will be summarized in tabular format where feasible. Each annual report will present

the monitoring methods and a description of the current conditions of the receptor sites, and will provide copies of field maps and data sheets, representative photographs, monitoring results, regional precipitation measurements for the year, an analysis of success and/or failure for all portions of the project, and recommendations for future maintenance and possible remedial measures or contingency plans, if necessary.

A discussion of any existing or future potential impacts to the transplanted slender mariposa lily that are known to the project biologist or that may occur as a result of human activities and environmental conditions also will be included. A year-end report will be submitted to Newhall Land by the end of each calendar year during the maintenance and monitoring period for distribution to the County. A final, end-of-the-project monitoring report shall be filed upon achievement of success criteria and final acceptance will be considered at that time.

7.0 COMPLETION OF MITIGATION AND PERFORMANCE CRITERIA

At the end of each year, the project biologist shall inform Newhall Land and the County of the progress of the project. When the long-term maintenance and monitoring period is complete, or sooner if the success criteria are achieved early, Dudek will initiate a meeting with Newhall Land and the County to review the conditions of the receptor sites and to document the status of the transplanted slender mariposa lily. Final performance criteria are included below in *Table 2*.

An adaptive management approach has been established in this plan and will be utilized for the 5-year maintenance and monitoring period, wherein backup contingency measures (such as providing supplemental water or planting nursery-grown individuals) will be initiated if it appears as though the project may not meet the established success criteria. In the unlikely event that the project has failed to sustain the transplanted slender mariposa lily during the 5-year period, then Newhall Land shall negotiate with the County, as appropriate, to determine contingency measures to be implemented to compensate for the failure of the program, if required.

TABLE 2
PERFORMANCE CRITERIA – SLENDER MARIPOSA LILY MITIGATION PROGRAM

Feature	Criteria	Monitoring Frequency	Findings	Action
Slender mariposa lily salvaging	All known slender mariposa lily individuals will be salvaged from within the project limits of grading.	Ongoing monitoring of salvaging operations	Estimate total number of individuals salvaged.	Remove all known slender mariposa lily individuals from within the project area where feasible.
Slender mariposa lily transplantation	Transplant salvaged bulbs and associated soil.	Ongoing monitoring and verification of work	Notify County of number salvaged and planted.	Install all bulbs at the pre-determined receptor locations according to this plan.
Slender mariposa lily survival	A minimum 1:1 ratio of the required 471 individuals producing vegetative growth during any of the last 3 years over the 5-year monitoring period	Spring of each year (April–May)	Demonstrated ability to persist at the receptor site by exhibiting evidence of vegetative growth and/or flowering	If successful, program complete. If not, remedial measures or additional maintenance and monitoring are to be implemented, if required.
Slender mariposa lily seed propagation at a native plant nursery	If it is determined that the success criteria are not being met, slender mariposa lily seed will be collected from the natural population near the mitigation site and propagated at a native plant nursery.	Coordinate propagation at a native plant nursery.	Document total amount of seed delivered and total bulbs obtained after propagation.	Plant propagated bulbs at receptor site during long-term monitoring period.
Maintenance, weed control, verification of fencing/ protection, and monitoring of herbivory	Remove invasive weeds from around and within slender mariposa lily transplant areas. Invasive perennial weeds not to exceed 10% cover at any time during the maintenance and monitoring period. Keep herbivore-exclusion fencing in place and functional. Check for rodent problems.	Monthly during the first-year growing period, quarterly thereafter until the end of the 5-year long-term maintenance and monitoring program	Verify weed maintenance and site protection. Assess herbivory on slender mariposa lily subpopulations.	Remedial measures and/or repairs as needed. Control invasive weed species throughout entire 5-year program.

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Spineflower Conservation Plan

JUNE 2007

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SPINEFLOWER CONSERVATION PLAN
June 2007

1.0 INTRODUCTION

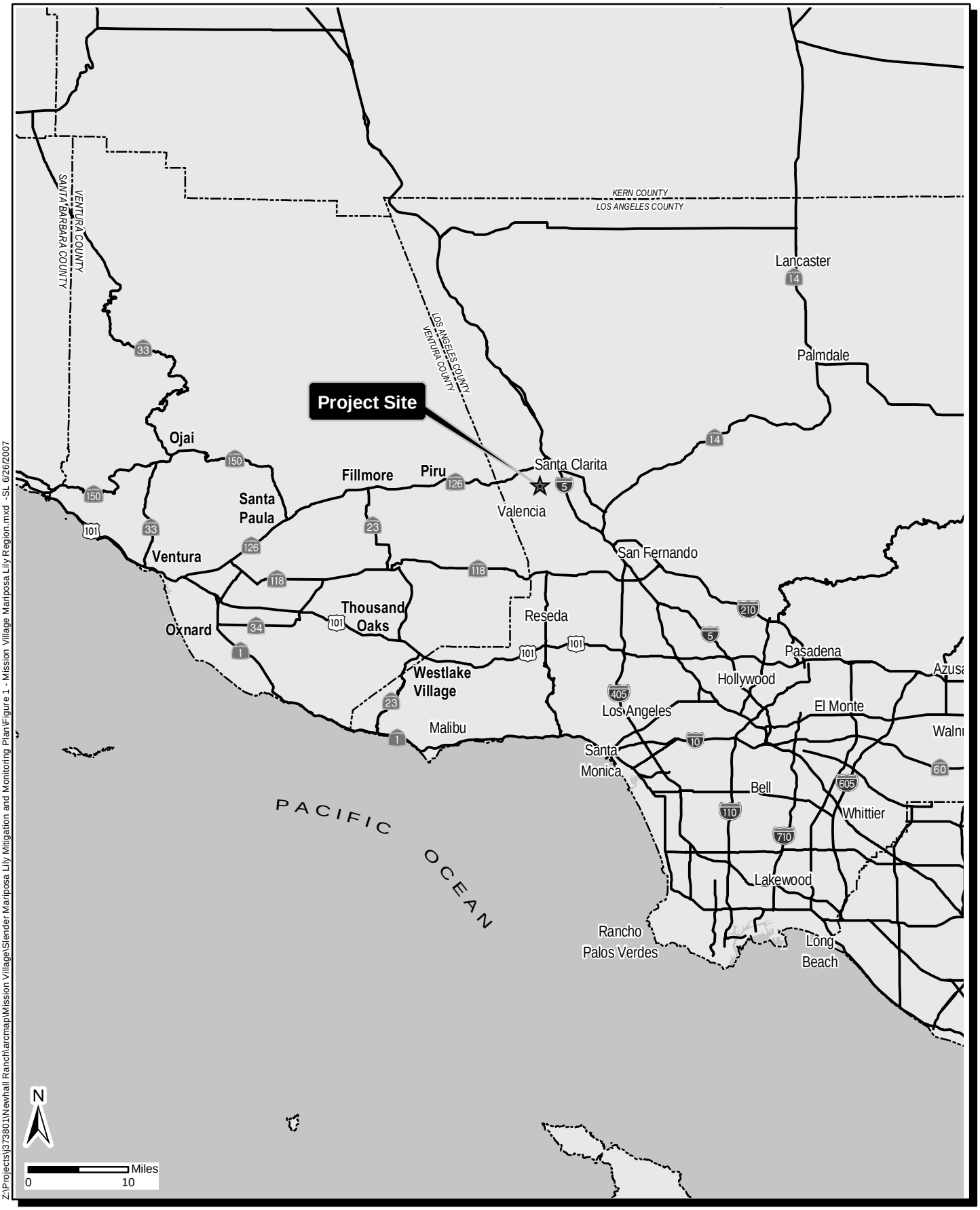
This Spineflower Conservation Plan (Plan) is a conservation and management plan to permanently protect and manage a system of preserves designed to maximize the long-term persistence of the San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*; spineflower or SFVS) within the project study area described below. This Plan describes a preserve system proposed by the applicant, The Newhall Land and Farming Company (Newhall or applicant). The management and monitoring components of this Plan have been developed in consultation with the California Department of Fish and Game (CDFG).

The Plan is organized as follows:

1.0 Introduction
2.0 Background and Regulatory Framework
3.0 Goals/Objectives
4.0 Species Description
5.0 Occurrence within Project Study Areas
6.0 Environmental Setting and Land Use
7.0 Preserve Design Approach and Methodology
8.0 Description of the Preserves
9.0 Management Activities
10.0 Long-Term Monitoring and Maintenance
11.0 Adaptive Management and Remedial Measures
12.0 Spineflower Introduction Program
13.0 Funding
14.0 Responsible Parties
15.0 Reporting
16.0 Schedule
17.0 Conservation and Take Estimates
18.0 References

1.1 Project Study Area Location

The proposed project study area addressed by this Plan includes portions of the Newhall Ranch Specific Plan Area (NRSP), Valencia Commerce Center (VCC) planning area, and Entrada planning area (project study area). The project study area is located in an unincorporated portion of the Santa Clara River Valley in northwestern Los Angeles County (*Figure 1*). The 11,963-acre



Z:\Projects\j373801\Newhall Ranch\arcmap\Mission Village\Slender Mariposa Lily Mitigation and Monitoring Plan\Figure 1 - Mission Village Mariposa Lily Region.mxd -SL 6/26/2007

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Newhall Land - San Fernando Valley
Spineflower Conservation Plan

Regional Map

FIGURE
1

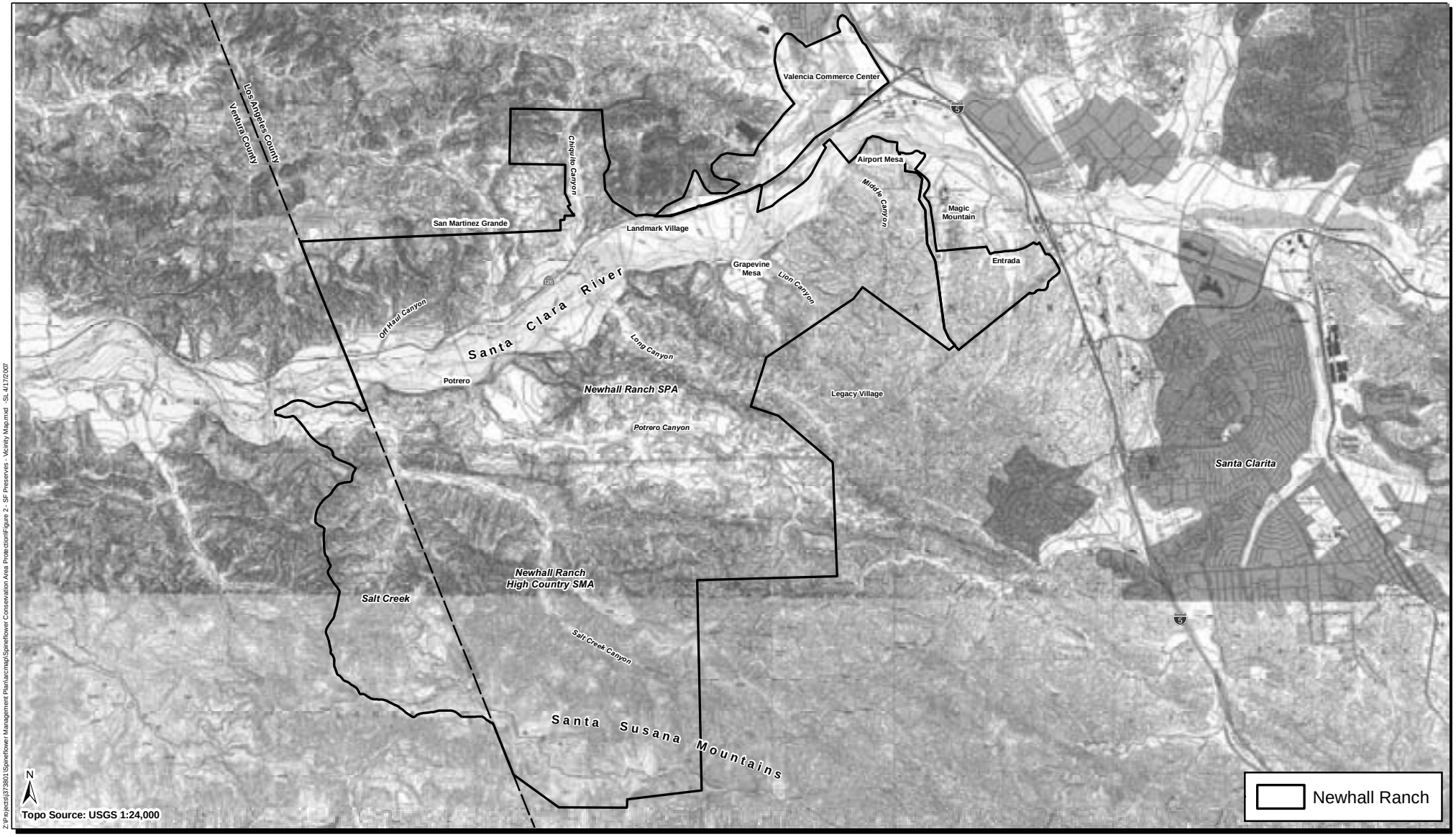
The NRSP lies roughly 0.5 mile west of Interstate 5 (I-5) and largely southwest of the junction of I-5 and State Route 126 (SR-126), with portions of the NRSP located in San Martinez Grande and Chiquito canyons north of SR-126. The Entrada planning area lies just west of I-5, south of SR-126, and just east of the NRSP. The VCC planning area lies roughly in the northwest corner of the junction of I-5 and SR-126, generally northeast of the NRSP and northwest of the Entrada planning area (*Figure 2*). Elevations in the project study area range from 825 feet above mean sea level (AMSL) in the Santa Clara River bottom at the Ventura County/Los Angeles County line to approximately 3,200 feet AMSL on the ridgeline of the Santa Susana Mountains along the southern boundary.

The City of Santa Clarita is located to the east of the project study area, and the Ventura County/Los Angeles County line is to the west. On a regional level, the Los Padres and Angeles National Forests are located to the north of the project study area, the Angeles National Forest lies to the east, and the Santa Susana Mountains are to the south.

1.2 Purpose and Need

The spineflower is the subject of this Plan. The SFVS is listed as an endangered species under the California Endangered Species Act (CESA) (California Fish and Game Code, Sections 2050-2097) and is a candidate species under the federal Endangered Species Act of 1973 (FESA) (16 U.S.C. Section 1531, et seq.).

The Plan encompasses the project study area (NRSP and the VCC and Entrada planning areas) in order to address comprehensive conservation planning on all Newhall Land properties within Los Angeles County supporting known spineflower populations. The information provided in this Plan will be used by the applicant in requesting a state permit authorizing the take of spineflower in the areas located outside designated spineflower preserves. Specifically, the applicant is requesting: (1) a Candidate Conservation Agreement (CCA) from the U.S. Fish and Wildlife Service (USFWS) under FESA, and (2) a Section 2081(b) incidental take permit from CDFG under CESA.



Z:\Projects\373801\Spineflower Management Plan\arcmap\Spineflower Conservation Area Protection\Figure 2 - SF Preserves - Vicinity Map.mxd - SL 4/17/2007

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0 0.75 1.5 Miles

Newhall Land - San Fernando Valley Spineflower Conservation Plan

Vicinity Map

FIGURE 2

The purpose and need for the Plan under the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. Section 4321, et seq.) and the Plan objectives under the California Environmental Quality Act (CEQA) (California Public Resources Code, Section 21000, et seq.) are:

> *To develop and implement a practicable/feasible comprehensive spineflower conservation plan that provides for the long-term persistence of spineflower within all Newhall Land properties containing known spineflower populations.*

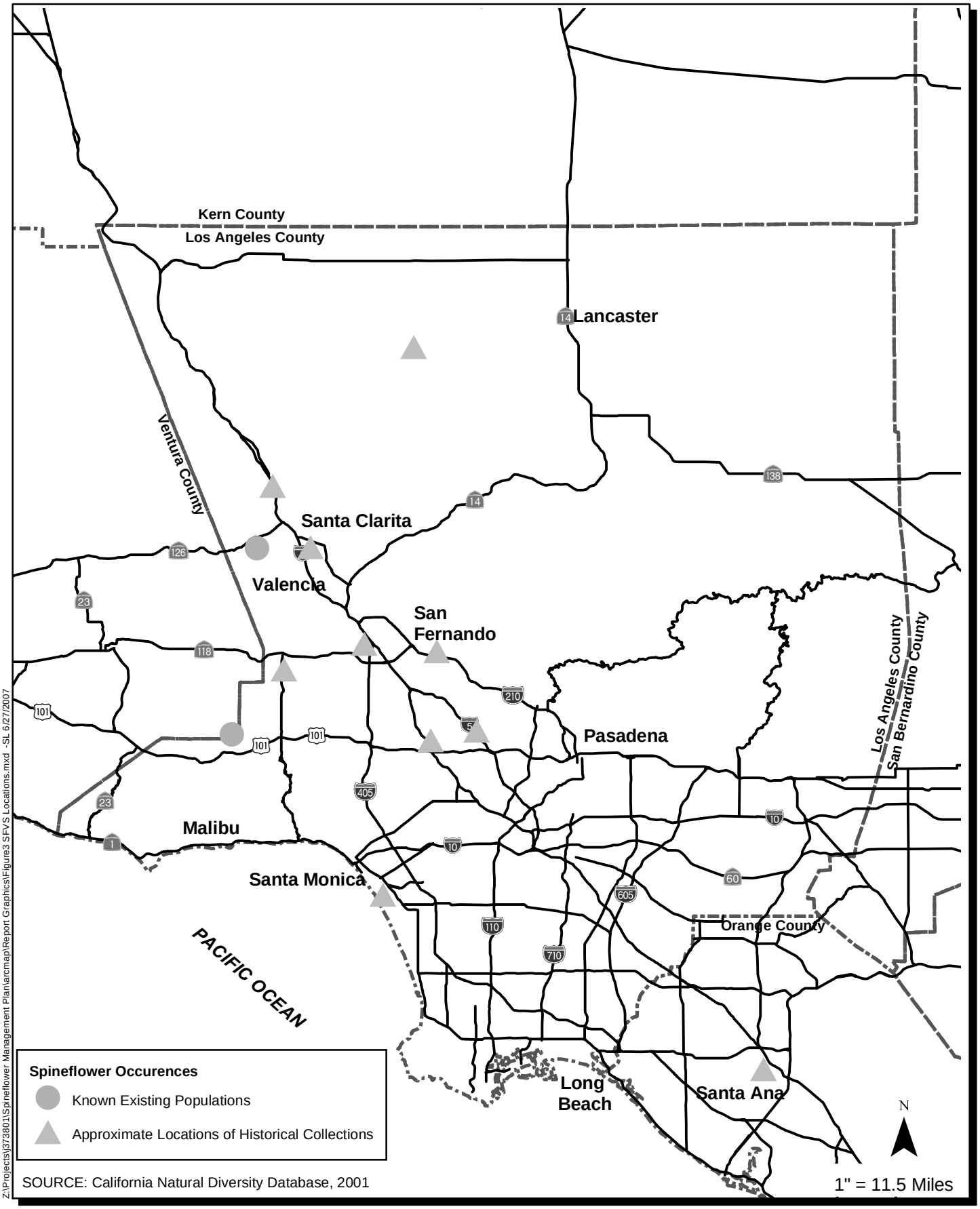
To comply with federal and state environmental review requirements under NEPA and CEQA, respectively, the impacts associated with this Plan are addressed in a joint Draft Environmental Impact Statement/Draft Environmental Impact Report (DEIS/DEIR). The U.S. Army Corps of Engineers (ACOE) and CDFG are the lead agencies in connection with preparation of the DEIS/DEIR.

2.0 BACKGROUND AND REGULATORY FRAMEWORK

In May 1999, there was only one known extant population of spineflower, located in Ventura County in the vicinity of Laskey Mesa on the Ahmanson Ranch property in the southeast edge of the Simi Hills.[1] Spineflower was thought to be extinct until it was rediscovered at Laskey Mesa in May 1999. It had last been collected in 1927 from the Castaic area of Los Angeles County (CDFG 2001). Subsequently, spineflower was discovered at Newhall Ranch in 2000.

In 2003, the Ahmanson Ranch property was acquired by the State of California through the Wildlife Conservation Board and transferred to the Santa Monica Mountains Conservancy (Conservancy) for the purposes of wildlife habitat preservation, corridor protection, restoration and management, wildlife-oriented education and research and for compatible public uses, consistent with wildlife habitat preservation and protection of sensitive biological resources. It is now called the Upper Las Virgenes Canyon Open Space. As a result, the USFWS has acknowledged that threats to the spineflower from the former Ahmanson Ranch development project have been eliminated. The USFWS and the CDFG are working with the Conservancy to manage the site, including conservation of spineflower located there.

Currently, spineflower is known from the Upper Las Virgenes Canyon Open Space in Ventura County and the applicant's land holdings in Los Angeles County. These two spineflower populations are approximately 17 miles apart (*Figure 3*).



SOURCE: California Natural Diversity Database, 2001

Z:\Projects\j373801\Spineflower Management Plan\arcmap\Report Graphics\Figure3 SFVS Locations.mxd - SL 6/27/2007

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Newhall Land - San Fernando Valley Spineflower Conservation Plan

Existing and Historical Locations of Spineflower

FIGURE 3

At the state level, spineflower was listed under the CESA as an endangered species in August 2001. At the federal level, the spineflower remains a federal candidate species; however, USFWS lowered the spineflower listing priority in 2004 to reflect a threat that is high but non-imminent.

3.0 GOALS/OBJECTIVES

The primary goal of this Plan is to develop a management and monitoring framework to ensure the long-term persistence of spineflower within the project study area through establishment of a system of preserves. Objectives that contribute to achieving this goal include the following:

1. Permanently protect and manage a system of preserves designed to maximize long-term persistence of SFVS. Preserves shall include habitat for potential pollinators and dispersal agents. Management of the preserves shall include restoration of degraded and/or damaged habitats and the establishment of site-specific buffers aimed at mitigating adverse edge effects from adjacent changes in land use.

2. Maintain biological connectivity between preserves and permanently protected and managed open space areas (e.g., river corridor, open areas, utility easements). Management in the open space areas shall include restoration of degraded and/or damaged habitats.

3. Preserves shall include spineflower occurrences that maximize genetic diversity and overall population size while capturing the range of environmental conditions where the taxon is found.

4. Design and implement restoration of damaged and degraded habitats within the preserves in a manner that provides opportunities for spineflower expansion, where appropriate.

5. Provide suitable habitat within designated preserves to accommodate natural evolutionary and ecological processes for the SFVS, such as spatial fluctuations and colonization events.

4.0 SPECIES DESCRIPTION

This section summarizes the biological data for the spineflower and includes a description of the results of previous and ongoing pollination, germination, and viability studies that have been conducted at Ahmanson Ranch in Ventura County and in the project study area in Los Angeles County.

4.1 Current Status

State: Endangered, August 2001
Federal: Candidate (Priority 6), May 2004
CNPS List 1-B 3-3-3.

4.2 Taxonomy

SFVS was first described as *Chorizanthe fernandina* by Watson in 1880. The type specimen was collected in 1879 from San Fernando Canyon near the San Fernando railroad station (Brown 1884 and Goodman 1934, as cited in Sapphos 2001). In 1923, Jepson revised the taxonomy of SFVS and renamed it *Chorizanthe parryi* var. *fernandina* (City of Calabasas 1999, 2000). SFVS is a member of the Polygonaceae family and is among 50 taxa in the genus *Chorizanthe* that occur in western North America and southwestern South America (Hickman 1993).

4.3 Distribution

SFVS is endemic to Southern California and is known from 10 historical locations and 2 current locations.

Historical Distribution

Historical records include specimens collected between 1879 and 1929 that represent at least 10 SFVS locations in Los Angeles and Orange counties (CDFG 2001; CNDDB 2006) (see *Figure 3*). In Los Angeles County, collections were made at nine locations within the San Fernando Valley along the foothills of the San Gabriel Mountains. Only one collection was made in Orange County from hills near Santa Ana. SFVS was thought to occur in San Diego and San Bernardino counties, but these locations were later determined to be mislabeled or misidentified (CDFG 2001).

Table 1 summarizes the 10 historical occurrences of SFVS previously located in Los Angeles County and Orange County (CDFG 2001; CNDDB 2006). However, all of the historical occurrences listed in *Table 1* except Element Occurrence 6 are considered extirpated (CDFG 2001; CNDDB 2006). Element Occurrence 6 is in the San Martinez Grande preserve area; historical observations in the area made in 1893 are attributed to this occurrence.

Table 1
Summary of the Historical Locations of SFVS

Element Occurrence	County	Location	Last Year Observed
1	Los Angeles	Little Tujunga Wash, along the southwest base of the San Gabriel Mountains	1920
2	Los Angeles	Elizabeth Lake, on sandy banks	1929
5	Los Angeles	Near Castaic, sandy wash along Castaic Valley	1929
6	Los Angeles	Newhall, general vicinity	1893
7	Los Angeles	Chatsworth Park, general vicinity	1901
8	Orange	Hills near Santa Ana, believed to have been in the foothills of Lomas de Santiago (CDFG 2001)	1902
9	Los Angeles	Ballona Harbor, in the general vicinity of Ballona Creek	1901
10	Los Angeles	San Fernando, in the vicinity of lower San Fernando dam just downstream from Los Angeles reservoir and upper Van Norman Lake	1922
12	Los Angeles	Burbank, general vicinity	1890
13	Los Angeles	Tolucca, vicinity of North Hollywood[2]	Before 1930

Current Distribution

Currently, SFVS is known from only two locations: the vicinity of Laskey Mesa in Ventura County (Element Occurrence 11; CNDDB 2006) and in the project study area (Newhall Land) in Los Angeles County (Element Occurrences 6, 14, 15, 16; CNDDB 2006). The Laskey Mesa area and project study area locations are approximately 17 miles apart. The Laskey Mesa is within 1 mile of the historical collection sites at Chatsworth Park (Element Occurrence 7 in 1901). Element Occurrence 6, collected in 1893, occurs within the project study area and is presumed to be the same as populations discussed herein in the San Martinez Grande preserve area (see *Figure 3*).

The Laskey Mesa area is located on the southern edge of the Simi Hills near the City of Calabasas in an area formally known as Ahmanson Ranch. The Simi Hills are within the

[2] There is an additional historical collection of SFVS housed at the Rancho Santa Ana Botanical Gardens dated 1930 (CDFG 2001).

Transverse Ranges geographic subdivision of California (Hickman 1993). Following the rediscovery of SFVS at Ahmanson Ranch, biologists working with Sapphos Environmental Consulting conducted a directed search for SFVS that included historical localities, suitable habitat areas within the historical range of SFVS, and suitable habitat areas near the existing population at Laskey Mesa. A total of 7 historical locations and 21 other locations were surveyed with negative results in 1999 and 2000 (Sapphos 2001).

Chapter 5 provides a discussion of the current known distribution within the NRSP and the Entrada and VCC planning areas on Newhall Land property holdings within the project study area in Los Angeles County.

4.4 Abundance

Historical records do not include information regarding the abundance of SFVS. Existing data on the abundance of SFVS and the area occupied are from annual surveys conducted at Ahmanson Ranch and in the project study area (Newhall Land) (*Table 2*). Surveys of the Ahmanson Ranch population at Laskey Mesa were conducted in 1999, 2000, 2001, and 2002. The population has varied from a low of 23,000 SFVS individuals in 1999 (a relatively dry year) to 1.8 million individuals in 2001 (a year of relatively normal rainfall) (Glenn Lukos Associates and Sapphos 2000; Sapphos 2003a).

Table 2
Annual Population Estimates of SFVS and Area Occupied at Ahmanson Ranch and Newhall Land

Area	1999	2000	2001	2002	2003	2004	2005	2006
Ahmanson Ranch (Population)	23,000	1.46 million	1.8 million	220,935	---	---	---	---
Ahmanson Ranch (Acres Occupied)	5.9	10.3	12.9	3.6				
Newhall Land (Population)	---	---	---	7,814	5.9 million	560,000	7.4 million	1.8 million
Newhall Land (Acres Occupied)	---	---	---	0.59[1]	16.36	5.32	11.43	8.48

[1] The 2002 acres occupied number does not include VCC; the VCC SFVS polygon boundaries were not mapped using GPS unit in 2002.

In the NRSP, SFVS locations were first identified at Airport Mesa and Grapevine Mesa during limited surveys conducted in 2000. However, 2000 survey data did not include population

estimates (URS 2002). In 2000, FLx and Katherine Rindlaub Biological Consulting recorded three polygons, representing 1,000 to 2,000 individuals of SFVS on Entrada (FLx, March 23, 2004, pers. comm.). In 2001, surveys of San Martinez Grande Canyon and VCC identified approximately 14,750 and 4,600 SFVS individuals, respectively (FLx 2002a, 2002b).

In 2002, 2003, 2004, 2005, and 2006, surveys were conducted throughout the NRSP and Entrada and VCC sites (*Table 2*). The number of SFVS individuals has varied dramatically from a low of 7,814 in 2002 to a high of 7.4 million in 2005 (Dudek 2002a-c, 2004a-f, 2005a-c, 2006a-c). The area occupied has also varied from year to year (*Table 2*). The total occupied footprint has increased each year since 2003. As of 2006, the total mapped footprint of spineflower occurrence in the project study area was 20.2 acres. In 2004, spineflower populations occupied 27% of the total mapped footprint of spineflower area. The area occupied varied in 2003, 2005, and 2006, but on average was more than double the area occupied in 2004, averaging about 60% occupancy.

The variation of SFVS abundance and area occupied from year to year is typical of annual plant species. In the case of SFVS, it appears that climatic conditions influence SFVS abundance and area occupied. At Newhall Land, the estimated number of SFVS was lower in 2002 and 2004, compared to 2003, 2005, and 2006. Years 2002 and 2004 experienced below-average rainfall; in year 2003, rainfall was considered normal, according to the Western Regional Climate Center. Winter 2004/spring 2005 rainfall was considered to be above normal; in winter 2005/spring 2006, rainfall was slightly below average but not as low as it was in 2002 and 2004, according to the Western Regional Climate Center.

At Laskey Mesa, only 50% of the SFVS were observed to flower in 2002, a below-average rainfall year (Sapphos 2003a). In relatively natural habitat areas of Grapevine Mesa in the spring of 2002, only a handful of individuals survived to reproduce; these were typically at locations protected from wind, beneath the drip line of a shrub, or otherwise more protected from exposure. Failed, desiccated rosettes were commonly observed (M. Meyer, CDFG, 2004, pers. comm.). With better climatic conditions in 2003 and 2005, the SFVS population at Newhall Land increased by several orders of magnitude.

It is important to emphasize that the population numbers described above are estimates: spineflower populations are highly aggregated and densities vary considerably within the same polygon. Preliminary studies indicate that variability between areas is lower than the variability from year to year (Dudek 2006d), although the exact area of occupancy has changed each year. For example, in 2002 and 2004, years of low abundance, spineflower occurred in some areas that

they did not occur in 2003, a highly abundant year. These results need further analyses and will be addressed by future monitoring described in *Section 10*. Analysis of variance (ANOVA) tests of the density of spineflower individuals and acres occupied at the five core locations gave contrasting results. The area occupied varied more between sites than between years, while density varied more annually than between sites. There was no significant interaction between year and site when a two-way ANOVA was used, which means all of the sites tended to change year to year in a similar fashion. More data are needed, but the preliminary interpretation is that preferred spineflower location is controlled by intrinsic environmental characteristics (e.g., soil type), while population density (and, in turn, actual numbers of individuals) is controlled by extrinsic environmental characteristics (e.g., rainfall).

After mapping the boundaries of each polygon, the number of individuals was counted/ estimated in a rectangular "sample estimation area," which is a subset of the total polygon. The sample estimation area was between 200 cm^2 (10 by 20 cm) and 2 m^2 (1 by 2 m), depending on various factors (e.g., size of the polygon, plant densities, variations in plant densities within the polygon). The number of subsets within the total polygon was determined and added/multiplied, resulting in a total estimate of the number of individuals of the polygon (e.g., 4×125=500, 8×12=96, 9×100=900). This number was then rounded to the nearest magnitude or multiple of a magnitude (e.g., 500, 100, 1,000). Although the spineflower population numbers are expected to overestimate true population densities (Dudek 2006), the area occupied should be accurate, as it represents completely mapped units. The general agreement between population estimates and occupied area indicates that, at least for general qualitative analyses, the population estimates are adequate.

Moreover, there is a substantial difference in the overall size of any given individual, which has a direct bearing on reproductive output. There is a positive logarithmic relationship between the size of SFVS individuals and involucre production, with smaller plants producing fewer involucres than larger plants (Sapphos 2003b). That is not to say that small individuals are less valuable. Small-size plants may be the result of poor conditions at a given micro-site where the plant was growing but also may relate to timing of germination. Later-germinating plants may not achieve the same overall size as plants that had more time to develop (Sapphos 2003b). However, later-germinating individuals likely contribute to the adaptability of the seedbank to respond to different environmental conditions. In rainfall years with multiple germination events, a mix of plant sizes may represent different ages of individual plants.

4.5 Description

SFVS is a low-growing herbaceous annual. Germination occurs following the onset of late-fall and winter rains and typically represents different cohorts emerging from the seed bank over the winter and early spring growing season. Spineflower initially forms a basal rosette. As day lengths increase in springtime, flowering stalks are produced. Flowering generally occurs between April and June. Overall size of spineflower can vary, ranging from small, button-sized erect plants with little branching to larger, decumbent plants up to 30.5 mm in height and between 5.1 and 40.6 mm across. Leaves are oblong to oblanceolate, between 5 and 40 mm and form a basal rosette. The involucre is urn shaped, with six bracts and straight awns enclosing its small white flower, which measures 2.5 to 3 mm (Hickman 1993). Each involucre produces a single flower that forms a single seed. SFVS can generally be differentiated from co-occurring spineflowers, including Turkish rugging (*C. staticoides*) and lastarriaea (*Lastarriaea coriacea*), by its decumbent habit, white flowers, entire leaves, and straight-tipped involucral awns. Plants become desiccated and die by late summer, leaving branches brittle and dry but usually with intact involucres still attached and containing seed. SFVS disarticulates (breaks apart) with clumps of four to eight involucres that are rigidly held together. In contrast, the involucres of Turkish rugging and lasterriaea disarticulate readily and one by one. Seeds are eventually released from the involucre, but the exact mechanism and timing of this release has not been described.

4.6 Habitat at Existing and Historical Locations

Vegetation

For purposes of discussing vegetation, the *Vegetation Classification and Mapping Program, List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* (CDFG 2003a) was used with a few exceptions. In certain instances, the vegetation communities observed in the field did not match the vegetation communities described by CDFG (2003a). In these instances, Dudek developed additional vegetation community classifications.

Historical accounts describe SFVS as occurring within scrub communities in washes, riverbeds, and upland sites. Although historical accounts do not provide specific information regarding local habitat conditions, based on their locations, occurrences described within upland areas probably occurred within California sagebrush scrub communities, while occurrences described as occurring within sandy washes were probably within Riversidean alluvial fan sage scrub communities (Sapphos 2001). Historically occupied habitat likely also included native grasslands

(M. Meyer, CDFG, 2004, pers. comm.). The interstitial spaces between bunchgrasses were likely occupied by annual forbs and geophytes, including various species of *Chorizanthe* (Keeley 1990).

At the two current known locations, SFVS generally occurs within sparsely vegetated grassland and scrub communities and associated ecotones. At Laskey Mesa, SFVS is described as occurring along the interface between California sagebrush scrub and grassland habitats. This observed distribution may be the result of past dryland farming of the mesa top, which likely removed any SFVS growing in the farmed area (CDFG 2001). Past farming and livestock grazing practices are likely to have modified the vegetation on Laskey Mesa; therefore, it is not known whether this area was native grassland, coastal scrub, or a mix of both prior to European contact. At Newhall Land, the majority of SFVS sites occur within California sagebrush scrub and California annual grassland but also occur on agricultural land. In this sense, agricultural land means areas recently subjected to terracing and grubbing for agricultural purposes, but which were not planted with actual crops or were planted with crops in the recent past. SFVS sites also occur within openings in southern coast live oak woodland, undifferentiated chaparral, and alluvial scrub. Sparsely vegetated areas with low overall cover of herbaceous vegetation and some bare ground are typical of existing SFVS sites at Ahmanson Ranch and Newhall Land, although SFVS has also been observed in areas of dense annual grasses.

Soils and Geology

A geologic investigation of historical and existing locations indicated that SFVS sites are associated with two generic conditions: **(1)** alluvial deposits of riverine systems and **(2)** contact points between exposed bedding planes where the parent material is exposed at the surface (Sapphos 2000). These conditions are consistent with the observation that SFVS occurs in areas with thin, poorly developed soils that are relatively low in nutrients. At Newhall Land, SFVS occurs on eight geologic formations: Artificial Fill, Quaternary Alluvium, Quaternary Landslide, Quaternary Older Alluvium, Quaternary Slopewash, Quaternary Terrace Deposits, Undifferentiated Terrace Deposits, and Undifferentiated Saugus Formation. The Saugus formation consists of interbedded sandstones, siltstones, and mudstones deposited during late Pliocene and early Pleistocene times, 2.5 to 0.7 million years before present. The Quaternary formations were deposited in the past 1.8 million years, during Pleistocene times (Seward 2004). At Laskey Mesa, the underlying geology is Tertiary-aged unnamed shale and sandstone, about 5.1 million years before present (Dibblee 1992), which is older than the underlying geologic formations at Newhall.

Existing and historical SFVS sites are potentially associated with a variety of soil units. Soil units at historical sites were highly variable, and 7 of the 12 historical sites lacked adequate specificity as to location such that it is not possible to determine the historical geologic and soil composition at these locations. Five sites that could be correlated with geologic data did not match those occurring on Ahmanson Ranch (Sapphos 2001). At Laskey Mesa, SFVS is associated with San Andreas sandy loam (2% to 9% slopes), Zamora loam (2% to 9% slopes), and Santa Lucia shaly silty clay loam (15% to 30% slopes) (Glenn Lukos and Associates, Inc. and Sapphos 2000). At Newhall Land, although SFVS sites occur on a variety of soil units, approximately 90% of polygons occurred within Terrace escarpments, Castaic-Balcom silty clay loams (30% to 50% slopes), Castaic-Balcom silty clay loams (30% to 50% slopes, eroded), Zamora loam (2% to 9% slopes), and Saugus loam (30% to 50% slopes). The occupied soils at Ahmanson Ranch and Newhall Land appear similar in that they are primarily loam or silty clay loam, with a much lower level of occurrence on sandy loams.

At both Laskey Mesa and Newhall Land, SFVS occurs primarily in areas of poorly developed soils with shallow depth to bedrock. At Laskey Mesa, soils in adjacent unoccupied areas with dense grasses were found to be more developed and have higher levels of nutrients. SFVS plants also frequently grew in areas of rock outcroppings in weathered, degraded parent material featuring poorly developed soils lacking true soil horizons (Sapphos 2001). SFVS distribution at Laskey Mesa is possibly influenced by past land use and invasion of European annual grasses and forbs and may be a response to a buildup of thatch, in light of the fact that livestock were removed from annual grasslands on Laskey Mesa about 8 years prior to the discovery of SFVS at Ahmanson Ranch (M. Meyer, CDFG, 2004, pers. comm.). Similarly, plants occurring in undisturbed areas on Newhall Land consistently occur on soils lacking the organic soil horizon, whereas occupied mesa-tops typically consist of very well-developed soils (Seward 2002).

SFVS sites also differ from adjacent unoccupied areas in the level of soil compaction. Soils at Ahmanson Ranch SFVS sites generally have higher bulk densities (dry weight of soil per unit of volume) than adjacent areas supporting non-native weedy species (St. John 1999, as cited in Sapphos 2001). SFVS are also in areas with disturbed soils, occurring along infrequently-used dirt roads and trails at Ahmanson Ranch (Sapphos 2001). On Newhall Land, SFVS are found on recently created artificial fill slopes and in areas disturbed by fossorial rodent activity. Specifically, within Entrada, SFVS occurs along manufactured slopes adjacent to the golf course, and a number of the occurrences in the undisturbed sage scrub throughout Entrada are associated with fossorial rodent activity. Within VCC, SFVS occurs along the edges of dirt roads that have been in use for decades. Within the NRSP, SFVS occurrences are associated with fossorial rodent activity in a number of areas of undisturbed sage scrub; in particular, San Martinez

Grande and the areas within and surrounding Potrero Mesa, Grapevine Mesa and Airport Mesa and in annual grasslands that have been used for grazing for decades.

Elevation, Slope, and Aspect

Existing SFVS populations in the vicinity of Laskey Mesa occur between 1,200 and 1,400 feet AMSL, while populations at Newhall Land occur between 960 and 1,320 feet AMSL (Sapphos 2001; Dudek 2002). SFVS occurs primarily on slopes with a south-facing aspect. These southern exposures experience more sunlight and heat, which leads to less dense herbaceous growth and/or less dense vegetation when compared to areas with a northern exposure. Therefore, SFVS's tendency to occur on these slope exposures may be due to the prevalence of more sparsely vegetated habitat areas on hotter, drier slopes.

At Laskey Mesa, site characteristics from 1999 to 2002 surveys indicated that 96% of occupied habitat had a predominantly south-facing aspect (Sapphos 2002). SFVS sites at Newhall Land are mostly on slopes with a south-facing component, with 50% of sites occurring on south-, southwest-, or southeast-facing slopes.

At Laskey Mesa, SFVS occurs on slopes with gradients between 4% and 47%, with an average slope of 20% (Sapphos 2001). These calculations may overestimate the slope because SFVS tends to occur in localized depressions or along narrow shelves and benches at Ahmanson Ranch (CDFG 2001). At Newhall Land, approximately 90% of SFVS occurrences are on slopes with gradients between 0% and 25%.

4.7 Competition

SFVS appears to occur most often in areas with little or no competing vegetation. This has also been reported for other species of *Chorizanthe* (Davis and Sherman 1992; McGraw and Levin 1998; Kluse and Doak 1999; Coppoletta and Moritsch 2002). Preliminary studies within the project study area found no correlation between spineflower densities and vegetation type (i.e., native or non-native herbs) or ground cover (e.g., thatch, bare ground, litter). The exception to this was a negative correlation, with the percentage of native shrubs indicating shading may be an inhibitor of spineflower occurrence (Dudek 2006).

Test-plot experiments at Laskey Mesa studied the effect of treatment combinations of vegetation removal and supplemental watering in both north- and south-facing plots by measuring mean number of plants, mean number of involucres, and mean plant size. Results indicated that

maintaining subplots free of all competing vegetation produced spineflower plants of exceptional size and number of involucres by producing additional primary, secondary, and tertiary branching (Sapphos 2003c). This result is similar to the response of SFVS individuals that germinated on grubbed slopes in the Airport Mesa area of Newhall Land in 2002. Exceptionally large plants were frequently observed at this location, while SFVS plants in more typical habitat areas with normal levels of competing vegetation were very small and frequently failed to survive the hot, dry conditions found during the 2002 growing season (M. Meyer, CDFG, 2004, pers. comm.). The Sapphos study also indicated that vegetation removal increased the number of seeds produced per plant; however, this was the result of an increase in the number of flowers produced and not of an increase in seed set (Sapphos 2003c).

The Sapphos study results indicated that any combination of vegetation removal, in which all vegetation other than spineflower was removed, had no significant effect in the west-/northwest-facing plot. However, in south-facing plots, vegetation removal had a significant effect on the mean number of plants within a plot and on the number of involucres produced per plant. Thus, when vegetation was removed, the number of involucres and mean plant size were significantly greater on south-facing plots than north-facing plots. Between north- and south-facing plots, there were no significant differences in plant number, number of involucres, or mean plant size when vegetation was not removed (Sapphos 2003c).

In a second Sapphos study at Laskey Mesa, vegetation removal was accomplished using a weed-whip or an herbicide (RoundUp). Following treatment, the vegetation and duff were removed from the plots, and the plots were seeded with SFVS. The plots treated with the herbicide experienced greater SFVS growth and reproductive output as compared to the weed-whipped plots (Sapphos 2003b). It is important to note that this outcome may have been influenced by rainfall conditions in 2003; rain fell through May 9, 2003. This could have resulted in regrowth of annual grasses within the weed-whipped plots. It is also important to note that the use of herbicides within SFVS preserves would require great caution and site-specific evaluation.

Furthermore, based on a study characterizing the habitat of slender-horned spineflower (*Dodecahema leptoceras*), a species closely related to SFVS, it was noted that soil in plots occupied by slender-horned spineflower had lower levels of nitrogen, phosphorous, electrical conductivity, and organic materials than distant unoccupied plots that appeared visually suitable. In addition, the soil in the occupied plots had higher values of nitrogen and electrical conductivity than unoccupied adjacent suitable plots. The soil in occupied plots had lower values of phosphorus and organic material than unoccupied adjacent suitable plots (Allen 1996). Therefore, it is important to note that while unoccupied adjacent and distant plots appeared

similar to occupied plots, there were differences in soil characteristics that may influence the success of slender-horned spineflower populations.

The results of the pilot study at Newhall Land (Dudek 2006) and the studies summarized above indicate that spineflower occurrence is controlled by a combination of environmental conditions and competition. SFVS tends to occur most often in open areas, particularly those lacking shrubs. Observed occurrences in settings with disturbed soils (i.e., road sides and burrows) could be interpreted as indicating spineflower is a successional specialist, but the consistent occurrence from 2002 to 2006 in the same areas indicates a highly environmentally controlled distribution.

4.8 Reproduction

Breeding System

SFVS flowers are protandrous (i.e., anthers release pollen prior to stigma becoming receptive to pollen), limiting the extent to which self-fertilization can occur within a flower. However, according to Jones et al. (2002), small flower size and a fruit set higher than expected for exclusively outcrossing systems (i.e., plants that must be pollinated by other plants) indicates that SFVS is likely a facultative selfer (i.e., a plant that can be pollinated by other plants or by itself). SFVS flowers produce a single achene (i.e., a one-seeded, dehiscent fruit), which apparently remains within the involucre even after the plant disarticulates (CBI 2000).

Germination and Viability

Germination and viability tests were conducted using SFVS seed collected from Ahmanson Ranch in 2000 and 2001 (RSABG 2000 and 2001, in Sapphos 2003). Seeds collected in 2000 were determined to have germination rates between 68% and 73% and viability rates of 90% to 96%. Seeds collected in 2001 had germination rates of between 46% and 49% and viability rates of 90% to 96%. Seed set was between 58% and 72% in 2000 and approximately 60% in 2001. Experiments conducted by Rancho Santa Ana Botanic Garden (RSABG) found that dramatic increases in germination rates were obtained by clipping seed coats (Sapphos 2001). Although this would indicate the presence of a physical seed coat dormancy, the mechanism by which dormancy is overcome in naturally occurring populations remains unknown.

Pollinators

The majority of information regarding the pollination biology of SFVS is from the results of studies carried out at Ahmanson Ranch by Jones et al. (2002). Five species of arthropods were found to be responsible for more than 75% of visits to SFVS flowers: ant sp. (*Dorymyrmex pyramicus*), European honeybee (*Apis mellifera*), ant sp. (*Solenopsis xylonii*), beetle sp. (*Dastyinae* sp.), and beetle sp. (*Zabrotees* sp.). Honeybees were the only species carrying sufficient amounts of pollen for analysis, but they were determined to have a high rate of floral constancy (94%). Floral constancy is a measure of how specific a floral visitor is to a given species on any single foraging flight (Jones et al. 2002). High floral constancy indicates that honeybees are capable of being effective SFVS pollinators.

Although the effectiveness of ants as SFVS pollinators remains uncertain, ants were among the most frequent visitors to SFVS in two different studies carried out at Ahmanson Ranch (LaPierre and Wright 2000; Jones et al. 2002). As observed by LaPierre and Wright (2000), the diameter of an SFVS flower is large enough to accommodate ant visitors, suggesting that pollination by ants is at least possible. In addition, Jones et al. (2002) found that SFVS exhibits relatively low nectar production per flower, which often forces floral visitors seeking nectar (such as ants) to visit many flowers while foraging, thereby ensuring the pollination of many flowers. Parasitic wasps and bean weevils were also noted as visitors to SFVS flowers, although it is unknown if either are effective pollinators (Jones et al. 2002).

At Newhall Land, Jones et al. (2004) conducted a pollination study at three locations: Grapevine Mesa (Site 1) and Airport Mesa (Site 2) within the NRSP and one location at Entrada (Site 3). The most common visitors during the mid-season (April 23-25, 2004) to Sites 1 and 2 were flies (67% and 58.5%) and beetles (27% and 21.5%). The most common visitors to Site 3 during the mid-season were ants (43%) and beetles (42%). During the late-season, May 7 through 9, 2004, the most common visitors at Site 1 were flies (83%) and beetles (12%). The most common visitors at Site 2 late-season were beetles (31%), ants (28%), and flies (25.5%), and the most common visitors at Site 3 late-season were ants (70%).

Jones et al. (2004) also evaluated the effectiveness of ants as pollinators. In the laboratory, spineflower was grown in two enclosures, one excluding all insects except ants (*Dorymyrmex insanus*) and one excluding all insects. The plants in the enclosure with ants experienced 64.6% seedset, while the plants in the enclosure without ants experienced 29.2% seedset. Thus, it would appear that ants can be effective pollinators and that spineflower is capable of self-pollination (however, viability studies have not yet been conducted for the seeds).

4.9 Seed Dispersal

Little is known about dispersal of SFVS seeds. Trapping studies conducted at Ahmanson Ranch in September 1999 investigated the potential role of small mammals in SFVS seed dispersal (Sapphos 2001). Four species were found in trap lines set within SFVS habitat: San Diego pocket mouse (*Chaetodipus fallax*), Pacific kangaroo rat (*Dipodomys agilis*), harvester mouse (*Reithrodontomys megalotis*), and deer mouse (*Peromyscus maniculatus*). No SFVS seeds were found attached to the animals' pelage, and neither seeds nor seed heads were found in the cheek pouches of kangaroo rats or pocket mice. However, this is not surprising given that the SFVS seeds may not disarticulate from the involucre for some months, which would potentially protect the seed from direct herbivory during that stage. In the field, involucres have been observed to attach to human skin, clothing, and shoes, suggesting potential for involucres containing seed to be carried away from the parent plant if they lodge on humans or other animals.

Based on spineflower seed germination tests conducted at Rancho Santa Ana Botanic Gardens (RSA), it appears that the involucres may inhibit or delay germination. Two germination studies conducted in 1999 and 2000 of spineflower seeds still retained within the involucres resulted in germination rates of 34% and 30%. Subsequent germination studies conducted for spineflower seeds removed from the involucres resulted in germination rates of 65% to 100% (M. Wall, RSA, 2004, pers. comm.).

Ants may play a role in the dispersal of SFVS. LaPierre and Wright (2000) noted one species of harvester ant (*Messor andrei)* carrying SFVS flower parts containing seeds to nest sites, and SFVS parts were also evident in *M. andrei* midden piles. Harvester ants are capable of foraging for seeds as far as 330 feet from the nest, creating the possibility that seeds may be dropped en route.

4.10 Seed Banks and Genetics

The appearance of significant new SFVS populations from year to year in the vicinity of Laskey Mesa and the project study area is consistent with the presence of a seed bank. Ferguson and Ellstrand (1999) note that seed banks are critical to maintaining genetic diversity among isolated populations of slender-horned spineflower, a close relative of the SFVS. In studies of slender-horned spineflower, current-year germinating plants were found to have greater genetic variation than seeds produced during the previous year, indicating that seed banks make important contributions to the genetics and population biology. Genetic variation within populations and within the species as a whole was found to be higher in slender-horned spineflower than is

generally expected for annuals or endemics. Similar investigations of the role of seed banks in SFVS genetics and population biology have not been conducted.

5.0 OCCURRENCE WITHIN PROJECT STUDY AREA

This section describes the results of the 2000, 2001, 2002, 2003, 2004, 2005 and 2006 surveys and the occurrence data within the study areas. The data discussed includes the number and distribution of occurrences and ecological indicators such as slope, aspect, vegetation, soils, and pollinators. The data also includes the results of the onsite geology and soils testing.

5.1 Description of Annual Survey Efforts

In 2000, URS surveyed portions of the NRSP to the south of and along the Santa Clara River corridor (URS 2002). SFVS was detected at sites along Grapevine Mesa and in the vicinity of Airport Mesa. FLx and Katherine Rindlaub found SFVS within Entrada in 2000 (FLx, March 23, 2004, pers. comm.). In 2001, FLx surveyed portions of VCC and the NRSP, including Long Canyon and San Martinez Grande Canyon, but excluded Grapevine Mesa and Airport Mesa (FLx 2002a, 2002b). At that time, SFVS was detected at sites on the north side of SR-126 at San Martinez Grande Canyon. In 2002, 2003, 2004, 2005 and 2006, Dudek conducted annual surveys throughout the NRSP and the VCC and Entrada planning areas (Dudek 2002a-c, 2004a-f, 2005a-c, 2006a-c).

5.2 Distribution and Abundance

The distribution of SFVS at Newhall Land has been consistently documented across the entire planning area for five consecutive growing seasons (2002-2006). For planning and discussion purposes, populations have been aggregated geographically into six general occurrences. Each occurrence consists of SFVS polygons that are generally in proximity to each other within a particular vicinity and separated from others by distance or existing site features (e.g., ridgelines, roadways, SR-126). The distribution of SFVS from 2002, 2003, 2004, 2005, and 2006 is shown in *Figure 4*.

The NRSP includes the Airport Mesa, Grapevine Mesa, Potrero Canyon, and San Martinez Grande Canyon occurrences. In 2003 and 2005, during years of average to higher-than-average rainfall, SFVS occurrences within the NRSP accounted for approximately 79% and 87%, respectively, of all SFVS observed at Newhall Land. The Entrada occurrence is located in the

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Newhall Land - San Fernando Valley Spineflower Conservation Plan

San Fernando Valley spineflower Occurrence Data - Airport Mesa

FIGURE 4

southeastern portion of the planning area. In 2003 and 2005, the Entrada occurrence accounted for approximately 20% and 10%, respectively, of SFVS observed at Newhall Land. The VCC occurrence is located on the slopes above Castaic Creek near Castaic Junction and, in 2003 and 2005, accounted for 1% and 3%, respectively, of the known SFVS individuals at Newhall Land.

Table 3 summarizes occurrence data and area occupied on the NRSP at Airport Mesa, Grapevine Mesa, Potrero Canyon, and San Martinez Grande Canyon and at the Entrada and VCC planning areas.

Table 3
Annual SFVS Population Estimates and Area Occupied at Newhall Land

	2002		2003		2004		2005		2006	
Area	**Number**	**Acres**	**Number**	**Acres**	**Number**	**Acres**	**Number**	**Acres**	**Number**	**Acres**
Airport Mesa	463	0.42	1,114,359	6.84	38,268	2.11	1,688,025	4.35	1,214,112	4.09
Grapevine Mesa	7,256	0.11	2,121,160	4.06	458,235	1.55	4,261,660	2.86	33,596	1.40
San Martinez Grande	75	0.03	1,124,388	2.10	1,387	0.62	123,527	1.39	1,050	1.02
Potrero	---	---	233,328	1.44	13,326	0.47	326,654	1.06	88,659	0.63
Valencia Commerce Center (VCC)	---	---	170,181	0.46	1,471	0.08	223,155	0.47	204,405	0.36
Entrada	20	0.03	1,183,704	1.45	45,701	0.49	768,792	1.31	231,674	0.98
Total	**7,814**	**0.59**	**5,947,120**	**16.136**	**558,388**	**5.32**	**7,391, 813**	**11.43**	**1,773,496**	**8.48**

As described in *Section 4.4*, the number of SFVS individuals has varied dramatically from a low of 7,814 in 2002 to a high of 7.4 million in 2005 (Dudek 2002a-c, 2004a-f, 2005a-c, 2006a-c). The area occupied has also varied from year to year (*Table 3*). In 2004, spineflower populations occupied 27% of the total mapped footprint of spineflower area. The area occupied varied in 2003, 2005, and 2006 but, on average, was more than double the area occupied in 2004. Empirical data on plant size was not collected, but individual plants appeared to be larger in 2003 and 2005 than in 2002, 2004, and 2006.

The variation of SFVS abundance and area occupied from year to year is typical of annual plant species. In the case of SFVS, it appears that climatic conditions may influence SFVS abundance and area occupied. At Newhall Land, the estimated number of SFVS was dramatically lower in 2002 and 2004, compared to 2003, 2005, and 2006. Years 2002 and 2004 experienced below-

average rainfall, but, in 2003, rainfall was considered normal, according to the Western Regional Climate Center. Winter 2004/spring 2005 rainfall was considered to be above normal and in winter 2005/spring 2006 was slightly below average but not as low as 2002 and 2004, according to the Western Regional Climate Center.

5.2.1 Newhall Ranch Specific Plan

Airport Mesa

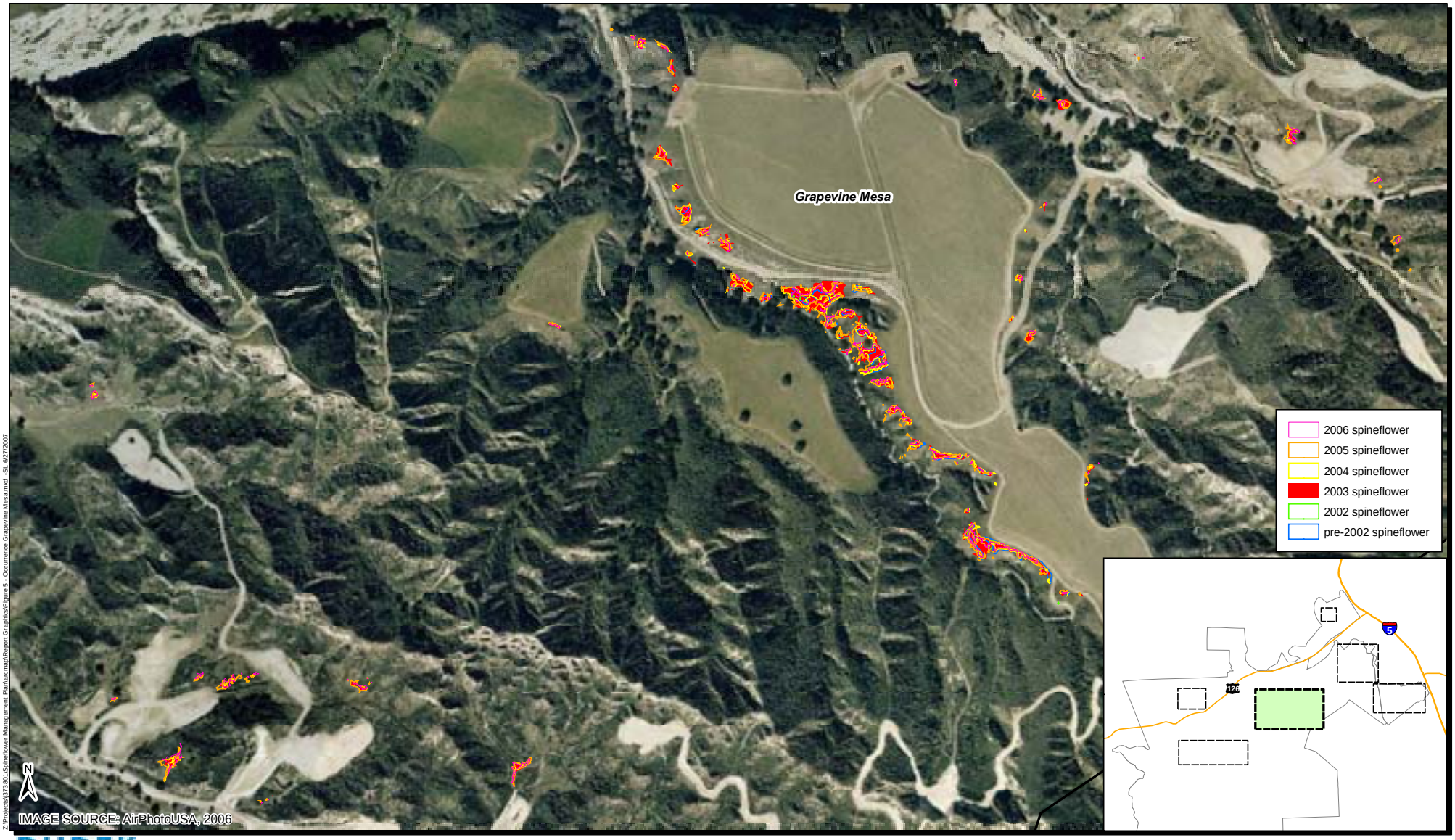
SFVS was first detected in the Airport Mesa vicinity in 2000. SFVS polygons were identified and mapped, but no population estimates were made at that time. In 2002, 463 SFVS individuals were observed in 34 polygons. Surveys conducted in 2003 identified 86 polygons and approximately 1.1 million individuals. In 2004, 137 polygons containing 38,268 individuals were detected. In 2005, 154 polygons containing 1.7 million individuals were detected. In 2006, 181 polygons containing 1.2 million individuals were detected. The distribution of SFVS from 2002, 2003, 2004, 2005, and 2006 is shown on *Figure 4*.

Grapevine Mesa

SFVS was first detected in the Grapevine Mesa vicinity in 2000, but no population estimates were made at that time. The majority of SFVS sites at Grapevine Mesa are located along the slopes to the west and south of the mesa. SFVS was mapped by FLx in 2000 prior to cultivation of the mesa top, and, at that time, the mapped polygon extended onto the top of the west side of the south half of Grapevine Mesa for about 100 feet (the occurrence was mapped by hand rather than by a GPS unit with sub-meter accuracy, so exact limits of polygons are not known). In 2002, approximately 7,256 plants were observed in 11 polygons. Surveys conducted in 2003 identified 80 polygons and approximately 2,121,160 individuals (Dudek 2004a). In 2004, 96 polygons containing 458,235 individuals were detected. In 2005, 108 polygons containing 4,261,660 individuals were detected. In 2006, 87 polygons containing 33,596 individuals were detected. The distribution of SFVS from 2002, 2003, 2004, 2005, and 2006 is shown on *Figure 5*.

San Martinez Grande Canyon

SFVS was first detected in the San Martinez Grande Canyon area in 2001 (FLx 2002b). Surveys conducted in May 2001 identified and mapped seven SFVS polygons totaling



Z:\Projects\373801\Spineflower Management Plan\arcmap\Report Graphics\Figure 5 - Occurrence Grapevine Mesa.mxd - SL 9/27/2007

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San Fernando Valley spineflower Occurrence Data - Grapevine Mesa

FIGURE 5

approximately 14,750 individuals. In 2002, only one polygon with 75 individuals was observed. Surveys conducted in 2003 identified 13 polygons totaling approximately 1.1 million plants. In 2004, 10 polygons were identified containing 1,387 individuals. In 2005, 11 polygons containing 123,527 individuals were detected. In 2006, 13 polygons containing 1,050 individuals were detected. The distribution of SFVS from 2002, 2003, 2004, 2005, and 2006 is shown on *Figure 6*.

Potrero Canyon

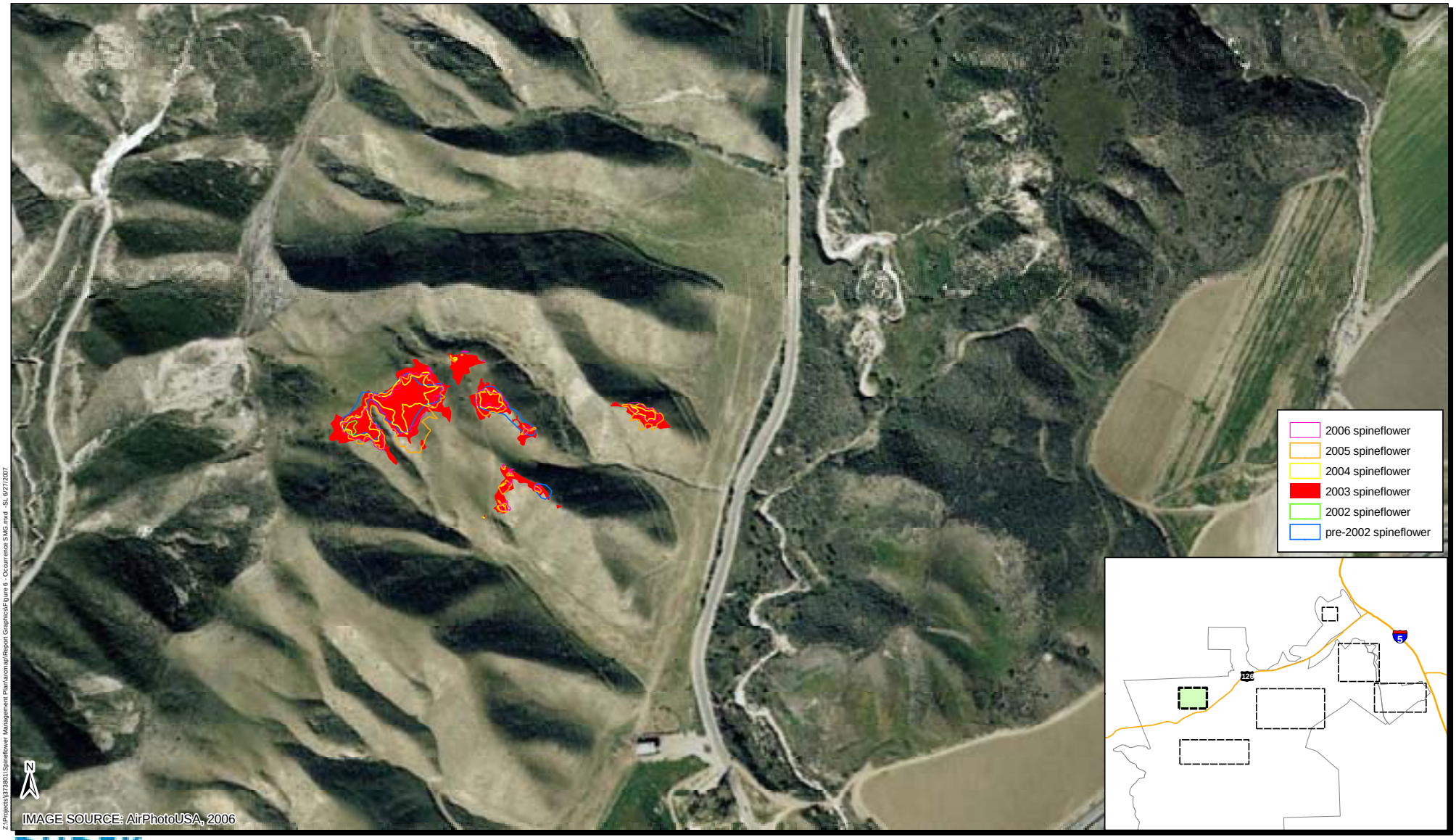
SFVS was not observed during surveys conducted in the area in 2002. The 2003 Potrero Canyon occurrence consists of 14 polygons and approximately 233,328 individuals. In 2004, 32 polygons containing 13,326 individuals were detected. In 2005, 27 polygons containing 326,654 individuals were detected. In 2006, 32 polygons containing 88,659 individuals were detected. The distribution of SFVS from 2003, 2004, 2005, and 2006 is shown in *Figure 7*.

5.2.2 Valencia Commerce Center Study Area

SFVS was first detected at the VCC study area in 2001. Seven polygons and approximately 4,600 individuals were observed in the study area (FLx 2002b). SFVS was not observed during surveys conducted in the study area in 2002. In 2003, a total of 27 polygons and approximately 170,181 individuals were observed in the study area (Dudek 2004b). In 2004, 24 polygons containing 1,471 individuals were detected. In 2005, 45 polygons containing 223,155 individuals were detected. In 2006, 15 polygons containing 204,405 individuals were detected. The distribution of SFVS from 2003, 2004, 2005, and 2006 is shown on *Figure 8*.

5.2.3 Entrada Study Area

SFVS was first detected at Entrada in 2000. Three polygons representing 1,000 to 2,000 individuals were mapped (FLx, March 23, 2004, pers. comm.). Surveys conducted in May, June, and September 2002 identified 20 SFVS individuals in 2 polygons. Surveys conducted in 2003 identified approximately 1,183,704 individuals within 29 polygons (Dudek 2004c). In 2004, 26 polygons containing 45,701 individual were observed. In 2005, 30 polygons containing 768,792 individuals were detected. In 2006, 37 polygons containing 231,674 individuals were detected. The distribution of SFVS from 2002, 2003, 2004, 2005, and 2006 is shown on *Figure 9*.



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San Fernando Valley spineflower Occurrence Data - San Martinez Grande

FIGURE 6

Z:\Projects\373801\Spineflower Management Plan\arcmap\Report Graphics\Figure 7 - Occurence Potrero Canyon.mxd SL 6/27/2007

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San Fernando Valley spineflower Occurrence Data - Potrero Canyon

FIGURE 7

Z:\Projects\373801\Spineflower Management Plan\arcmap\Report Graphics\Figure 8 - Occurrence VCC.mxd - SL 6/27/2007

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San Fernando Valley spineflower Occurrence Data - Valencia Commerce Center

FIGURE 8

Z:\Projects\373801\Spineflower Management Plan\arcmap\Report Graphics\Figure 9 - Occurrence Entrada.mxd SL 6/27/2007

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FIGURE 9

5.3 Habitat at Project Study Area

5.3.1 Vegetation

On Newhall Land, SFVS sites occur predominantly within openings in sparsely vegetated California sagebrush, California buckwheat, and grassland communities. Approximately 89% of 2003 SFVS polygons on Newhall Land occur within California sagebrush scrub (62%) or California annual grassland (27%), while 11% of SFVS polygons occur within coast live oak woodland, mixed chaparral, chaparral, disturbed land, Great Basin scrub, valley oak grassland, and alluvial scrub. Similarly, approximately 93% of 2005 SFVS polygons on Newhall Land occur within California sagebrush scrub (67%) or California annual grassland (26%), while 7% of SFVS polygons occur within coast live oak woodland, mixed chaparral, chaparral, disturbed land, Great Basin scrub, valley oak grassland, and alluvial scrub. Characteristic site conditions include a low cover of grasses, herbs, and shrubs and a visible component of bare ground.

5.3.2 Soils and Geology

Soils at SFVS sites varied among combinations of sandy and gravelly silt and clay loams. Approximately 89% of 2003 SFVS polygons occur on terrace escarpments, Zamora loam (2% to 9% slopes), Castaic-Balcom silty clay loams (30% to 50% slopes), Castaic-Balcom silty clay loams (30% to 50% slopes, eroded), and Saugus loam (30% to 50% slopes). Approximately 81% of 2005 SFVS polygons occur on terrace escarpments and Castaic-Balcom silty clay loams (30% to 50% slopes). Most of the plants at Grapevine Mesa and some at Airport Mesa are downslope of terrace surfaces capped by Zamora clay loam (2% to 9% slopes), with a few plants occurring on artificial fill or alluvium derived from adjacent terrace deposits. SFVS at San Martinez Grande Canyon occurs primarily on old landslide debris (Seward 2002).

Soil chemistry was evaluated for 39 locations within the NRSP, Entrada, and VCC sites (unpublished data). Twenty-seven of the locations were occupied by SFVS. The samples were taken using a shovel; multiple samples were taken at each location. Typically, the samples were taken from soil surface to a depth of 5 inches, between 1 and 2 inches deep, and between 6 and 12 inches deep. Each sample was assessed for 46 soil chemistry characteristics, including elements such as magnesium, nitrogen, phosphorus, calcium, and lead; soil texture categories such as sand, silt, and clay; and other characteristics such as moisture and pH. The data were evaluated using a forward, stepwise linear regression, which indicated that the following soil chemistry characteristics were significant indicators of a site being occupied by SFVS: magnesium, molybdenum, pH, lime, and tin. However, when these five characters were

evaluated for occupied and unoccupied sample locations, there was overlap in the value ranges. Thus, it does not appear that soil chemistry is a good predictor of whether a site represents potentially suitable habitat for spineflower.

Soil texture was also evaluated at these 39 locations. The sand content at occupied spineflower sites ranged from 30% to 70%, with an average of 57%. The silt content ranged from 20% to 48%, with an average of 32%. The clay content ranged from 5% to 22%, with an average of 12%. The silt-to-clay ratio ranged from 1.82 to 5.79, with an average of 2.97 (Seward 2004). Thus, it does not appear that soil texture will be useful in predicting whether a site represents potentially suitable habitat for spineflower.

Underlying geologic formations include artificial fill, Quaternary alluvium, Quaternary landslide, Quaternary older alluvium, Quaternary slopewash, Quaternary terrace deposits, undifferentiated terrace deposits, and undifferentiated Saugus Formation (Seward 2004). The study area is located within the Transverse Ranges geomorphic province of Southern California in the eastern portion of the Ventura depositional basin. This basin was produced by tectonic downwarping in the geologic past to produce a large-scale synclinal structure in which a thick sequence of Cenozoic sediments has accumulated. These sediments have been lithified into a sequence of sedimentary rock that has subsequently been uplifted, tilted, and tectonically deformed. They are cut by segments of the Del Valle and Salt Creek faults. Bedrock formations found on site include the Modelo, Towsley, Pico, Saugus, and Pacoima formations, as well as Quaternary terrace deposits. Surficial deposits include Quaternary alluvium, slopewash, soil, and artificial fill (Seward 2002).

5.3.3 Elevation, Slope, and Aspect

The majority of 2003 and 2005 SFVS sites occur on gentle to moderate slopes with a south-facing aspect at elevations between 960 and 1,320 feet AMSL. More than 90% of 2003 SFVS occurrences and 98% of 2005 SFVS occurrences are on slopes with gradients between 0% and 25%. Approximately 50% of 2003 SFVS occurrences and 37% of 2005 SFVS occurrences occur on south-, southwest-, or southeast-facing slopes, with 10% of 2003 SFVS sites and 19% of 2005 SFVS sites on north-, northwest-, or northeast-facing slopes.

6.0 ENVIRONMENTAL SETTING AND LAND USE

This section describes the existing environmental setting in the project study area. In addition, the existing and planned land uses are described, including ongoing agricultural operations and planned land uses associated with the project study area.

6.1 Environmental Setting and Existing Land Uses

6.1.1 Newhall Ranch Specific Plan

Surrounding land uses to the north include rural residential uses in the Val Verde and San Martinez Grande areas, a landfill in Chiquito Canyon, commercial business parks at VCC, residential and commercial uses in the Castaic corridor, oil and natural gas production, and undeveloped land. To the west, land uses include agricultural operations, undeveloped land, and oil and natural gas production. To the east, land uses include commercial/recreational uses associated with Six Flags Magic Mountain Amusement Park (and associated hotels, restaurants, and gas stations), residential uses at Stevenson Ranch, the Valencia Water Reclamation Plant, a California Highway Patrol station, and undeveloped land. To the south, the land is undeveloped (Impact Sciences 1999).

Native and naturalized habitats within the study area are representative of those found in this region and provide high-quality examples of those plant communities found in the Santa Susana Mountains and the Santa Clara River ecosystems. Upland habitats dominate the landscape within the NRSP, both north and south of the Santa Clara River. The major upland plant communities include California sagebrush scrub, chamise and undifferentiated chaparral, southern coast live and valley oak woodlands, and California annual grassland. However, the site also contains valley oak savanna and California walnut woodland (Dudek 2006). The Santa Clara River supports a variety of riparian plant communities, including southern cottonwood-willow riparian forest, southern willow scrub, mulefat scrub, arrow weed scrub, and herbaceous wetland. Intermittent and ephemeral drainages on site also provide habitat for alluvial and scalebroom scrubs.

The riparian habitat along the Santa Clara River has been designated as critical habitat by the USFWS for the state- and federally-listed endangered least Bell's vireo (*Vireo bellii pusillus*) (USFWS 1994) and provides habitat for the state- and federally-listed endangered southwestern willow flycatcher (*Empidonax traillii extimus*). The river itself supports the state- and federally-listed endangered and state fully-protected unarmored threespine stickleback (*Gasterosteus*

aculeatus williamsoni). There are two significant ecological areas (SEAs) in the NRSP, including **(1)** diverse oak woodland habitats that function as a wildlife corridor/linkage between the San Gabriel and Santa Monica Mountains (SEA 20) and **(2)** aquatic habitat within the Santa Clara River corridor that supports unarmored threespine stickleback (SEA 23) (Impact Sciences 1999).

The NRSP is topographically diverse, with slope gradients ranging from moderate to steep on the hillsides to very gentle in the Santa Clara River floodplain and in major tributary canyons. Also, there are mesas adjacent to the Santa Clara River (e.g., Grapevine Mesa and Airport Mesa). Site elevations range from 825 feet AMSL in the Santa Clara River bottom at the Ventura County/Los Angeles County line to approximately 3,200 feet AMSL on the ridgeline of the Santa Susana Mountains along the southern boundary. The primary ridges are east-, west-, and northwest-trending, with secondary ridges trending north and south. There are many distinctive ridges in the NRSP, including Sawtooth Ridge along the northeastern side of Long Canyon and Round Mountain at the northern edge of Potrero Canyon (Impact Sciences 1999).

The applicant leases portions of the NRSP for oil and natural gas production, as well as for cattle grazing, ranching, and agricultural operations (e.g., food crop production, dry land farming, honey farming). All such operations are currently ongoing. In addition, the applicant leases the site to the movie industry for set locations. Minor land uses include employee houses, an oil company office, and miscellaneous structures. In addition, there are several easements on the NRSP, including oil, natural gas, electrical, telephone, and water easements (Impact Sciences 1999). In particular, Southern California Edison and Southern California Gas Company maintain distribution lines within on-site easements.

Grazing activities and oil and natural gas production have had an effect on much of the natural habitat on site. Scrub habitats have been displaced by annual grasslands as a result of grazing, land clearing for agriculture, and other historical land uses. In addition, the site has been fragmented by dirt and asphalt roads, graded oil well pads and pipelines, and pumping, storage, and transmission facilities.

6.1.2 Valencia Commerce Center Planning Area

The VCC site is dominated by north-/south-trending ridges that lie north of Castaic Creek near the confluence with Hasley Canyon. Site elevations range from just under 1,000 feet AMSL in the Castaic Creek bottom to just over 1,500 feet AMSL at the top of the western ridge. The ridges are generally rounded at the top with slopes that vary from steep to gentle. Aside from the

ridges, the two major wash areas on the VCC planning area, Castaic Creek and Hasley Canyon, contain numerous benches and braided channels with associated riparian and wash scrub habitats.

Native and naturalized habitats within the VCC study area include representative examples of those plant communities found in the Santa Susana, Topatopa, and Liebre mountains and the Santa Clara River and Castaic Creek ecosystems. Upland habitats dominate the landscape within the study area (e.g., California sagebrush scrub, valley oak woodland, and California annual grasslands); however, Castaic Creek and Hasley Canyon support a variety of riparian plant communities (e.g., southern willow scrub, southern cottonwood-willow riparian forest, and mulefat scrub). No observations were made of any freshwater marsh or seep areas in the study area (Dudek 2006).

Historically, the applicant leased portions of the site for sand and gravel production, cattle grazing, and agricultural operations; only agricultural operations are currently ongoing. In addition, there is commercial/industrial development on the site. All of these activities have had an effect on much of the natural habitat on site (i.e., scrub habitats have been displaced by annual grasslands). Southern California Edison and Southern California Gas Company also have distribution lines and access roads within on-site easements.

6.1.3 Entrada Planning Area

The southern portion of the Entrada site is dominated by several north-/south-trending ridges. A narrow panhandle (roughly 100 meters wide) extends along the western portion of the site (east of Airport Mesa) to an agricultural field adjacent to the Santa Clara River. Site elevations range from approximately 1,000 feet AMSL along the Santa Clara River to approximately 1,550 feet AMSL on the ridges in the southwestern portion of the site.

Slope gradients range from moderate to very steep in the hillside areas to very gentle within the Santa Clara River floodplain, drainages, and associated mesas. Distinctive geographic features include the north-/south-trending ridges on the southern portion of the site, a wash that drains north through the site to a concrete-lined drainage channel that passes through the Six Flags Magic Mountain Amusement Park, and the Santa Clara River on the northwestern portion of the site.

Native and naturalized habitats within the Entrada site are representative of those found in this region and provide examples of those plant communities found in the Santa Susana Mountains

and the Santa Clara River ecosystems. California sage scrub, chamise and mixed chaparral, valley oak and scrub oak woodlands, and native and annual grasslands are the major upland plant communities on the site. Ephemeral and intermittent drainages on site provide habitat for alluvial and scalebroom scrubs. The northeast portion of the site includes an agriculture field and some intact upland habitats. While upland habitats dominate the landscape within the site, immediately adjacent to the site are areas that support a variety of riparian plant communities. These include southern cottonwood-willow riparian forest, southern willow scrub, mulefat scrub, arrow weed scrub, and freshwater marsh and seeps.

The applicant leases portions of the site for cattle grazing and agricultural operations. Grazing activities have had an effect on much of the natural habitat on site. Scrub habitats have been displaced by annual grasslands, apparently as a result of grazing. Southern California Edison and Southern California Gas Company have transmission lines within easements along the southern portion of the site, all of which are actively maintained. The Six Flags Magic Mountain Amusement Park is to the north of the site, and a residential development is located south of the site.

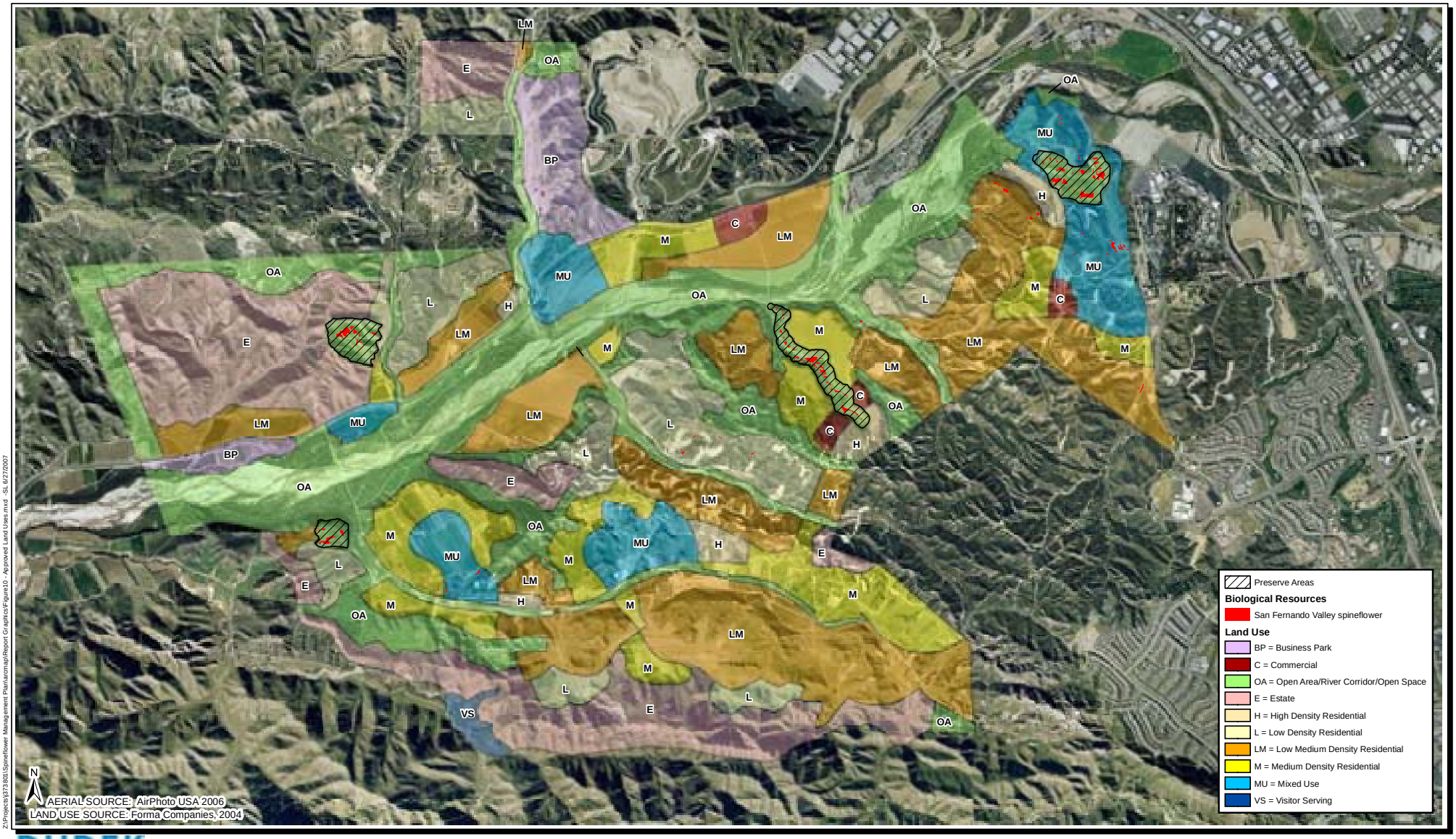
6.2 Planned Land Uses

The project study area is located within the Santa Clarita Valley Planning Area of the Los Angeles County General Plan (County of Los Angeles 1993). The NRSP received final approvals in May 2003 (County of Los Angeles 2003). The VCC site, approved by the County of Los Angeles in 1991 (County of Los Angeles 1991), includes 12 million square feet of industrial/commercial buildings, and approximately 6 million square feet of buildings have been constructed to date. The Entrada site is planned for residential, commercial, non-residential, and open space uses; however, the County has not approved changes in the Entrada land use designations or zoning at this time.

This section addresses spineflower occurrences in the project study area in relation to approved and proposed development.

6.2.1 Newhall Ranch Specific Plan

The NRSP contains approximately 11,963 acres. The acreages of the land uses within the NRSP are listed in *Table 4* and shown in *Figure 10*. The NRSP includes 22,038 dwelling units on 4,835 acres (including seven school sites, parks, and other facilities), 640 acres of mixed-



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Newhall Land - San Fernando Valley Spineflower Conservation Plan

Newhall Ranch Specific Plan Approved Land Uses

FIGURE 10

use development (e.g., commercial, residential, office), 67 acres of commercial development, 256 acres of business park uses, 37 acres of visitor-serving development, 6,138 acres of open area, 186 acres of community parks, 367 acres of community facilities (e.g., fire stations, library, water treatment plant), and arterial roads and bridges (County of Los Angeles 2003).

Table 4
Acreage of Each Approved Land Use in the NRSP

APPROVED LAND USE	ACRES
Open Area/River Corridor/Open Space	6,170
Residential/Commercial/Non-Residential	5,793
TOTAL	**11,963**

Source: County of Los Angeles 2003.

6.2.2 Valencia Commerce Center Planning Area

The VCC site contains 1,265 acres. The acreages of each approved land use for the VCC site are listed in *Table 5* and shown in *Figure 11*. There are only two categories of land use at this time: 673.1 acres of industrial/commercial development and 592 acres of open space (Sikand 2002). Approximately 137 acres (6 million square feet) of the project site are currently occupied by industrial/commercial development.

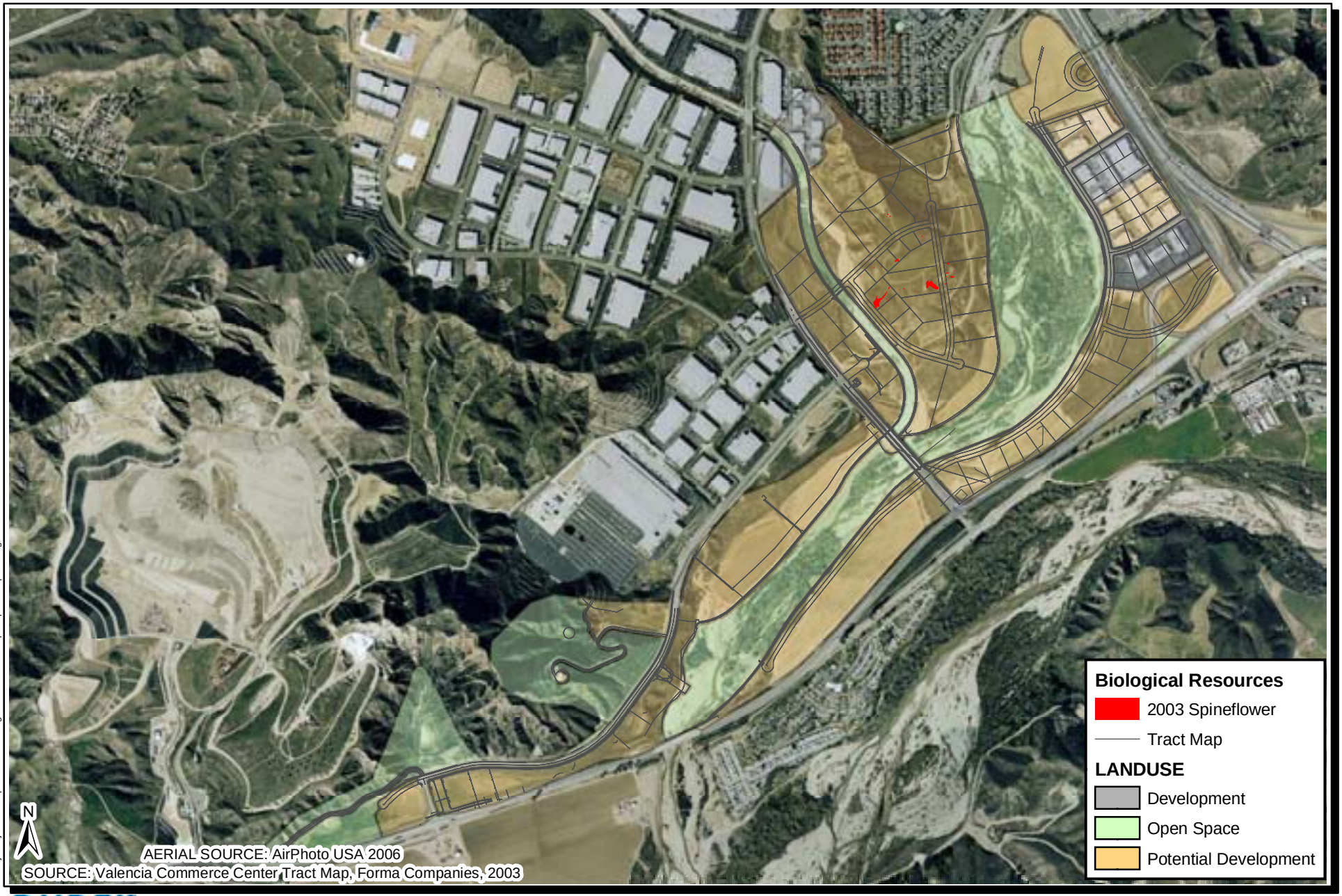
Table 5
Acreage of Each Approved Land Use in VCC

APPROVED LAND USE	ACRES
Open Space	592
Commercial/Industrial Development	673.1
TOTAL	**1,265.1**

Source: Sikand 2002.

6.2.3 Entrada Planning Area

The Entrada site contains 530 acres. The acreage of each proposed Entrada land use is listed in *Table 6* and shown in *Figure 12*. It is projected that 130 acres of land will be preserved as open space. The remaining 400 acres are proposed for residential, commercial, and non-residential uses.



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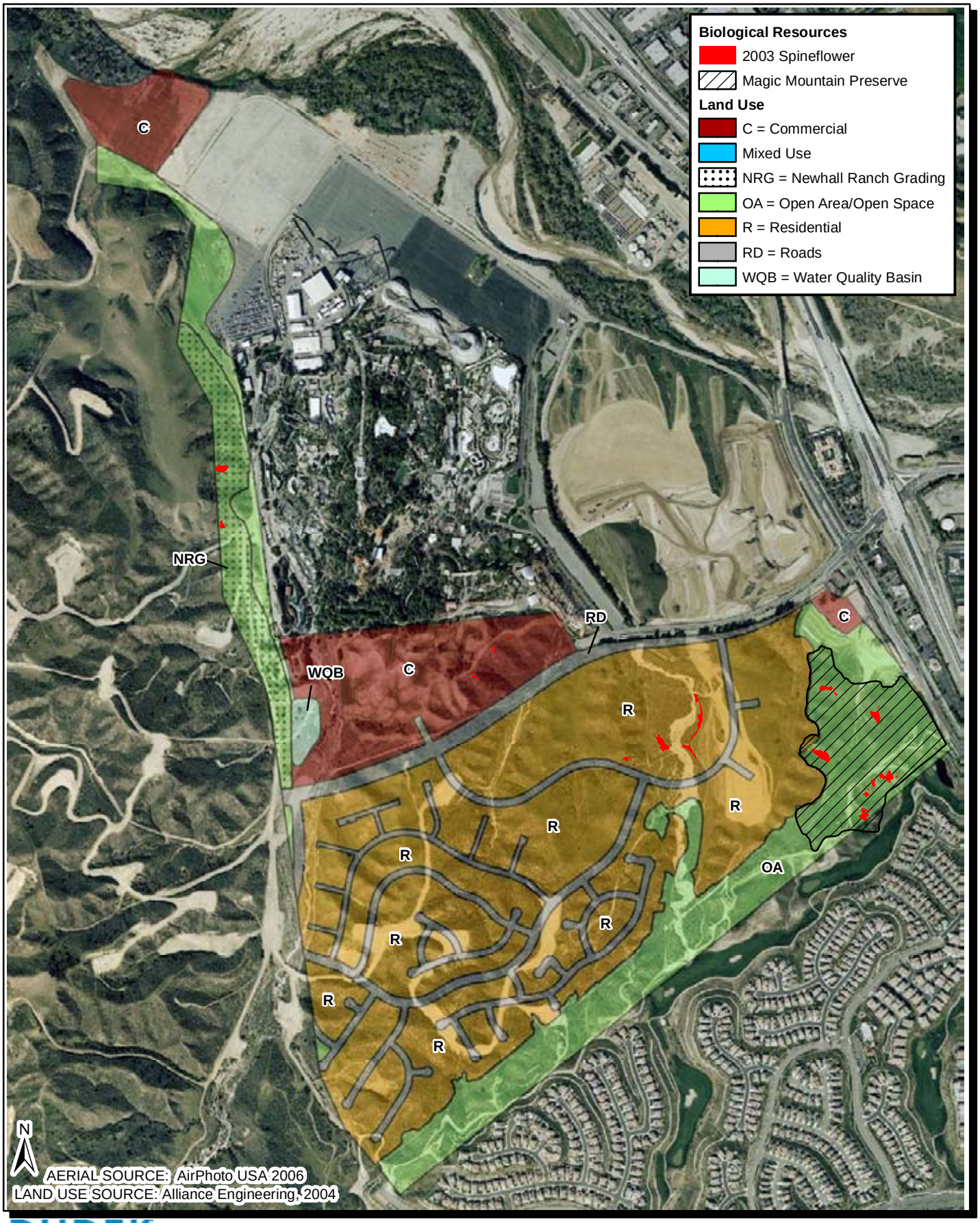
Newhall Land - San Fernando Valley Spineflower Conservation Plan

Valencia Commerce Center Projected Land Use

FIGURE 11



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Newhall Land - San Fernando Valley
Spineflower Conservation Plan

Entrada Projected Land Use

FIGURE
12

Table 6
Acreage of Each Projected Land Use in Entrada

PROJECTED LAND USE	ACRES
Open Space	130
Residential/Commercial/Non-Residential	400
TOTAL	**530**

7.0 PRESERVE DESIGN APPROACH AND METHODOLOGY

This section describes the approach and methods used to identify and design the five proposed spineflower preserve areas within the Newhall Land project study area. This section discusses spineflower distribution data, habitat suitability, and ecological indicators. It also addresses accommodating fluctuations in spineflower populations and preserve connectivity. For purposes of this discussion, CDFG indicated that ecological indicators, such as soils, pollinators, and vegetation, would be informative in designing the proposed preserve areas.

A habitat suitability index (HSI) was used to evaluate the entire project study area and was based on frequency distributions of spineflower using the following ecological indicators: vegetation, soils, geology, elevation, slope, and aspect. The HSI did not produce statistically suitable data. As a result, an alternative method of evaluating the five identified preserve areas—a representative model—was selected. Both approaches are discussed in more detail below.

7.1 Habitat Suitability Index for the Entire Project Study Area

The HSI was computed using the following data sets: vegetation, soils, geology, elevation, slope, and aspect. The vegetation data set for the NRSP was obtained in digital form from FORMA. The vegetation data set for Entrada and VCC was mapped by Dudek on February 13, 2004, on a 2002 aerial base and digitized into a Geographical Information System (GIS) format. At that time, Dudek also updated the vegetation mapping within and adjacent to the proposed preserves, including percent bare ground. The Soil Survey Geographic Base (SSURGO), which is designed for natural resource planning and management, was downloaded from the Soil Conservation Service website. The statewide geologic data set was purchased from the California Geologic Survey, originally digitized from the 1977 geologic map of California by Charles W. Jennings. A Digital Elevation Model (DEM) was computed from the U.S. Geological Survey (USGS) 40-foot contours using ArcGIS spatial analyst. From that DEM, slope and aspect coverages were derived.

Each of the six data layers was intersected with the 2003 spineflower occurrence data to determine the number of spineflower individuals within each individual attribute of each data set (vegetation, soils, geology, elevation, slope, and aspect).

Dudek performed a categorical regression for the six data sets using the entire spineflower occurrence. The intent was to then use the weights of the individual attributes within each data set and the relative weights of each data set to generate an HSI. The R-squared value for the categorical regression is 0.14 (adjusted R-squared value of 0.07). That means that the category weighting explains only 7% of the variation of the SFVS occurrence data within the study area. The category weighting does not account for the other 93% of the variation in the occurrence data.

Due to the low R-squared value, Dudek attempted to increase resolution within the geology data set using an updated geologic layer produced by Allan E. Seward Engineering Geology, Inc. (Seward) for Newhall. Due to the significant efforts of transforming the new geology point data into polygons, it was decided to use a subset of the study area for a first comparison. Thus, Seward created a new geology data set for a 430-acre area, including Airport Mesa, within the NRSP. The new Seward geology layer had six geology categories for the 430-acre study area, while the older California Geologic Survey had two geology categories for the same study area. Dudek ran two new categorical regressions for the 430-acre area using the original vegetation, soils, elevation, slope, and aspect data sets with the new geology layer and the old geology layer. The R-squared value for the categorical regression using the new geology layer was 0.40 (adjusted R-squared value 0.283) and the R-squared value for the categorical regression using the old geology layer was 0.46 (adjusted R-squared value 0.33). As the new geology layer actually decreased the R-squared value, it did not seem that the creation of a new geology layer for the entire study area was warranted.

Given the low R-squared values for the weighted data sets (0.14 not adjusted; 0.07 adjusted), it did not seem prudent to use the data sets to produce an HSI to assist in the evaluation of the five proposed preserve areas or to develop management and monitoring recommendations and techniques within the preserve areas.

The results of this effort indicate that either existing habitat data may be too coarse to resolve the actual habitat features that SFVS selects or that habitat features are not predictive of spineflower occurrence. It is possible that further studies at a finer scale are needed to better refine the various habitat parameters differentiating occupied SFVS habitat from unoccupied areas.

7.2 Representative Model for the Preserve Areas

Dudek utilized a representative model to evaluate the proposed preserve areas and compared the distribution of the individual attributes within each data set for the entire study area and for the five proposed preserve areas.

As shown in *Tables 7A* and *7B*, the five proposed preserves would conserve approximately 80% of the 2003 and 2005 SFVS individuals and approximately 70% of the total area occupied by spineflower. The 2003 and 2005 occurrences were included for evaluation using this representative model because these 2 years represent the greatest number of individuals observed with relatively normal rainfall. The following 10 tables (*Tables 8A* through *Table 12B*) show the number of spineflower individuals preserved and total area, in acres, of suitable spineflower habitat preserved according to each data set.

The majority of spineflower observed in 2003 (*Table 7A*), occurred in California sagebrush scrub, undifferentiated chaparral, and California annual grassland. Approximately 74% of individuals and 69% of the area observed in 2003 would be preserved within the California sagebrush scrub, 86% of individuals and 86% of area would be preserved within chaparral, and 98% of individuals and 92% of area would be preserved in the California annual grassland. The remaining six vegetation types contain approximately 11% of the spineflower individuals and 9% of the occupied area. The proposed preserve areas would conserve, on average, 63% of the individuals and 44% of the area within these vegetation types.

Table 7A
Spineflower Occurrence by Vegetation Type and Occupied Land Area, 2003

Number of Individuals						
Vegetation Type	Individuals in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Vegetation
Agricultural	2,698	0.05	2453	245	0.04	90.92
Burned California Sagebrush Scrub	842,711	14.17	842,711	0	14.17	100
Basin Sage Scrub	299,068	5.03	0	299,068	0	0
California Annual Grassland	1,554,841	26.14	1,517,522	37,319	25.52	97.60
Chaparral	1,638,664	27.55	1,404,485	234,179	23.62	85.71
California Sagebrush Scrub	911,817	15.33	420,278	491,539	7.07	46.09
California Sagebrush Scrub (Artemisia)	400	0.01	200	200	0.003	50.00
California Sagebrush Scrub (Coyote	118,394	1.99	78,715	39,679	1.32	66.49

Table 7A
Spineflower Occurrence by Vegetation Type and Occupied Land Area, 2003

Bush)						
California Sagebrush Scrub/Chaparral	18,741	0.32	137	18,604	0.002	0.73
California Sagebrush Scrub (Purple Sage)	155,152	2.61	153,102	2,050	2.57	98.68
Disturbed California Sagebrush Scrub (Purple Sage)	69,211	1.16	69,211	0	1.16	100
Disturbed Land	236,846	3.98	162,011	74,835	2.72	68.40
Live Oak Woodland	28,616	0.48	16,617	11,999	0.28	58.07
River Wash	32,650	0.55	28,029	4,621	0.47	85.85
Valley Oak Grassland	37,277	0.63	27,664	9,613	0.47	74.21
Total	**5,947,097**	**100%**	**4,723,145**	**1,223,952**	**79.42%**	
Number of Acres						
	Acres in Study Area	**Percent of Existing Population**	**Preserved**	**Not Preserved**	**Preserved Population as Percent of Existing Population**	**Percent Conserved by Vegetation**
Agricultural	0.02	0.12	0.01	0.01	0.06	50.00
Burned California Sagebrush Scrub	1.50	9.16	1.50	0	9.16	100
Basin Sage Scrub	0.32	1.95	0	0.32	0	0
California Annual Grassland	3.47	21.20	3.20	0.27	19.55	92.22
Chaparral	2.23	13.62	1.92	0.31	11.73	86.10
California Sagebrush Scrub	6.24	38.12	3.60	2.64	21.99	57.69
California Sagebrush Scrub (Artemesia)	0.01	0.06	0.001	0.01	0.01	10.00
California Sagebrush Scrub (Coyote Bush)	0.26	1.59	0.09	0.18	0.55	34.62
California Sagebrush Scrub/Chaparral	0.04	0.24	0.001	0.04	0.01	2.50
California Sagebrush Scrub (Purple Sage)	0.85	5.19	0.83	0.02	5.07	97.65
Disturbed California Sagebrush Scrub (Purple Sage)	0.34	2.08	0.34	0	2.08	100
Disturbed Land	0.60	3.67	0.30	0.30	1.83	50.00
Live Oak Woodland	0.24	1.47	0.15	0.10	0.92	62.50
River Wash	0.09	0.55	0.08	0.01	0.49	88.89
Valley Oak Grassland	0.16	0.98	0.05	0.11	0.31	31.25
Total	**16.37**	**100**	**12.04**	**4.33**	**73.76**	

The majority of spineflower observed in 2005 occurs in similar areas as in 2003 (*Table 7B*), with California sagebrush scrub accounting for 30% of individuals and 54% of the area. California annual grassland accounted for 23% of the individuals and 22% of the area. Chaparral accounted for 40% of the individuals and 16% of the area. Approximately 56% of individuals observed would be preserved within the California sagebrush scrub. Approximately 96% of individuals and 90% of area observed in the California annual grassland and 96% of individuals and 83% of area observed in chaparral would be preserved. The remaining vegetation types represented 7% of the spineflower individuals and 8% of the area. Of the six remaining categories, the proposed preserve areas would conserve, on average, 52% of the individuals and 30% of the area.

Table 7b
Spineflower Occurrence by Vegetation Type and Occupied Land Area, 2005

	Number of Individuals					
	Individuals in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Vegetation
Agricultural	2,471	0.03	673	1,798	0.01	27.24
Burned California Sage Scrub	82,632	1.14	82,632	0	1.14	100
Basin Sage Scrub	103,012	1.43	0	103,012	0.00	0.00
California Annual Grassland	1,651,937	22.87	1,583,626	68,311	21.92	95.86
Chaparral	2,903,720	40.20	2,792,766	110,954	38.66	96.18
California Sagebrush Scrub	1,554,918	21.53	828,798	726,120	11.47	53.30
California Sagebrush Scrub (Artemesia)	135	0.00	0	135	0.00	0.00
California Sagebrush Scrub (BS)	60,169	0.83	0	60,169	0.00	0.00
California Sagebrush Scrub (Coyote Bush)	210,589	2.92	53,463	157,126	0.74	25.39
California Sagebrush Scrub/Chaparral	26,832	0.37	4,742	22,090	0.07	17.67
California Sagebrush Scrub (Purple Sage)	144,464	2.00	142,904	1,560	1.98	98.92
Disturbed California Sagebrush Scrub (Purple Sage)	100,727	1.39	100,727	0	1.39	100
Disturbed Land	252,862	3.50	179,030	73,832	2.48	70.80
Live Oak Woodland	34,916	0.48	30,733	4,183	0.43	88.02
River Wash	82,709	1.14	82,522	187	1.14	99.77
Valley Oak Grassland	11,484	0.16	3,245	8,239	0.04	28.26
Total	**7,223,577**	**100%**	**5,885,861**	**1,337,716**	**81.48%**	

Table 7b
Spineflower Occurrence by Vegetation Type and Occupied Land Area, 2005

Number of Acres						
	Acres in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Vegetation
Agricultural	0.02	0.18	0.002	0.02	0.02	10.0
Burned California Sage Scrub	0.88	7.71	0.88	0	7.71	100
Basin Sage Scrub	0.16	1.40	0	0.16	0	0
California Annual Grassland	2.49	21.80	2.23	0.26	19.53	89.56
Chaparral	1.83	16.02	1.52	0.31	13.31	83.06
California Sagebrush Scrub	4.13	35.99	2.21	1.91	19.35	53.77
California Sagebrush Scrub (Artemesia)	0.01	0.09	0	0.01	0	0
California Sagebrush Scrub (BS)	0.09	0.79	0	0.09	0	0
California Sagebrush Scrub (Coyote Bush)	0.34	2.98	0.10	0.24	0.88	29.41
California Sagebrush Scrub/Chaparral	0.08	0.79	0.02	0.06	0.18	22.22
California Sagebrush Scrub (Purple Sage)	0.40	3.50	0.39	0.01	3.42	97.5
Disturbed California Sagebrush Scrub (Purple Sage)	0.30	2.63	0.30	0	2.63	100
Disturbed Land	0.51	4.47	0.25	0.26	2.19	49.02
Live Oak Woodland	0.11	0.96	0.03	0.08	0.26	27.27
River Wash	0.04	0.35	0.03	0.01	0.26	75.0
Valley Oak Grassland	0.05	0.44	0.01	0.04	0.09	20.0
Total	**11.42**	**100%**	**7.96**	**3.46**	**69.71%**	

As described in *Tables 8A* and *8B,* the majority of spineflower individuals occur in terrace escarpments (23% in 2003 and 52% in 2005). Castaic-Balcom silty clay loams (30% to 50% slopes) accounted for 22% and 30% of the existing individuals in 2003 and 2005, respectively. Castaic-Balcom silty clay loams (30% to 50% slopes eroded) accounted for 19% and 3% of the existing population in 2003 and 2005, respectively. Zamora loam (2% to 9% slopes) accounted for 13% in 2003 and 6.5% in 2005. The proposed preserve areas will include between 69% and 98% of individuals observed in each of these soil types in 2003; they will include between 64% and 99% of individuals observed in each of these soil types in 2005. By area, Castaic-Balcom silty clay loams (30% to 50% slopes), combining the eroded and non-eroded category, and terrace escarpments contain 79% of the occupied area in 2003 and 77% in 2005. The proposed preserve areas would conserve 76% of the occupied area in these three soil types in 2003 and 74% in 2005.

Table 8A
Spineflower Occurrence by Soil Type, 2003

Number of Individuals						
	Individuals in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Soils
Castaic and Saugus Soils, 30% to 65% Slopes, Severely Eroded	251,562	4.24	0	251,562	0	0
Castaic-Balcom Silty Clay Loams, 30% to 50% Slopes	1,324,868	22.31	919,871	404,997	15.49	69.43
Castaic-Balcom Silty Clay Loams, 30% to 50% Slopes, Eroded	1,145,353	19.29	1,124,374	20,979	18.94	98.17
Hanford Sandy Loam, 2% to 9% Slopes	15,654	0.26	15,654	0	0.26	100.00
Metz Loam, 2% to 5% Slopes	341,289	5.75	1,179	340,110	0.02	0.35
Metz Loamy Sand, 2% to 9% Slopes	113	0	0	113	0	0
Saugus Loam, 30% to 50% Slopes	740,010	12.46	725,097	14,913	12.21	97.98
Saugus Loam, 30% to 50%, Eroded	0	0	0	0	0	0
Sorrento Loam, 2% to 5% Slopes	86	0	0	86	0	0
Terrace Escarpments	1,337,390	22.52	1,315,097	22,293	22.15	98.33
Yolo Loam, 0% to 2% Slopes	720	0.01	0	720	0.00	0.00
Zamora Loam, 2% to 9% Slopes	780,745	13.15	612,563	168,182	10.32	78.46
Total	**5,937,790**	**100%**	**4,713,835**	**1,223,955**	**79.39%**	
Number of Acres						
	Acres in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Soils
Castaic and Saugus Soils, 30% to 65% Slopes, Severely Eroded	0.31	1.89	0	0.31	0	0
Castaic-Balcom Silty Clay Loams, 30% to 50% Slopes	7.24	44.25	4.71	2.54	28.79	65.06
Castaic-Balcom Silty Clay Loams, 30% to 50% Slopes, Eroded	2.27	13.88	2.1	0.17	12.84	92.51
Hanford Sandy Loam, 2% to 9% Slopes	0.54	3.30	0.54	0	3.30	100
Metz Loam, 2% to 5% Slopes	0.44	2.69	0.01	0.44	0.06	2.27
Metz Loamy Sand, 2% to 9% Slopes	0.003	0.02	0	0.003	0	0

Table 8A
Spineflower Occurrence by Soil Type, 2003

Saugus Loam, 30% to 50% Slopes	0.75	4.58	0.75	0	4.58	100
Saugus Loam, 30% to 50%, Eroded	0.14	0.86	0	0.14	0	0
Sorrento Loam, 2% to 5% Slopes	0.001	0.01	0	0.001	0	0
Terrace Escarpments	3.36	20.54	3.01	0.35	18.40	89.58
Yolo Loam, 0% to 2% Slopes	0.01	0.06	0	0.01	0	0
Zamora Loam, 2% to 9% Slopes	1.28	7.82	0.92	0.37	5.62	71.88
Total	**16.36**	**100%**	**12.03**	**4.33**	**73.59%**	

Table 8B
Spineflower Occurrence by Soil Type, 2005

Number of Individuals						
	Individuals in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Soils
Castaic and Saugus Soils, 30% to 65% Slopes, Severely Eroded	183,297	2.54	0	183,297	0	0
Castaic-Balcom Silty Clay Loams, 30% to 50% Slopes	2,155,933	29.85	1,447,103	708,830	20.03	67.12
Castaic-Balcom Silty Clay Loams, 30% to 50% Slopes, Eroded	193,452	2.68	123,529	69,923	1.71	63.86
Hanford Sandy Loam, 2% to 9% Slopes	18,986	0.26	18,986	0	0.26	100.00
Metz Loam, 2% to 5% Slopes	99,474	1.38	301	99,173	0.00	0.30
Metz Loamy Sand, 2% to 9% Slopes	27,083	0.37	0	27,083	0	0
Sorrento Loam, 2% to 5% Slopes	0	0	0	0	0	0
Saugus Loam, 30% to 50% Slopes	305,751	4.23	300,752	4,999	4.16	98.37
Saugus Loam, 30% to 50%, Eroded	46,203	0.64	0	46,203	0	0
Terrace Escarpments	3,724,599	51.57	3,692,627	31,972	51.12	99.14
Yolo Loam, 0% to 2% Slopes	132	0	0	132	0.00	0
Zamora Loam, 2% to 9% Slopes	468,070	6.48	301,961	166,109	4.18	64.51
Total	**7,222,980**	**100%**	**5,885,259**	**1,337,721**	**81.63%**	

Number of Acres

	Acres in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Soils
Castaic and Saugus Soils, 30% to 65% Slopes, Severely Eroded	0.44	3.85	0	0.44	0	0
Castaic-Balcom Silty Clay Loams, 30% to 50% Slopes	4.88	42.73	3.11	1.77	27.23	63.73

Table 8B
Spineflower Occurrence by Soil Type, 2005

Castaic-Balcom Silty Clay Loams, 30% to 50% Slopes, Eroded	1.62	14.19	1.39	0.23	12.17	85.80
Hanford Sandy Loam, 2% to 9% Slopes	0.22	1.93	0.22	0	1.93	100
Metz Loam, 2% to 5% Slopes	0.26	2.28	0.003	0.26	0.03	1.15
Metz Loamy Sand, 2% to 9% Slopes	0.05	0.44	0	0.05	0	0
Riverwash	0.003	0.03	0.003	0	0.03	100
Saugus Loam, 30% to 50% Slopes	0.79	6.92	0.74	0.05	6.48	93.67
Saugus Loam, 30% to 50%, Eroded	0.10	0.88	0	0.10	0	0
Terrace Escarpments	2.31	20.23	2.03	0.28	17.78	87.88
Yolo Loam, 0% to 2% Slopes	0.001	0.01	0	0.001	0	0
Zamora Loam, 2% to 9% Slopes	0.75	6.57	0.47	0.28	4.12	62.67
Total	**11.42**	**100%**	**7.96**	**3.46**	**69.77%**	

As depicted in *Table 9A,* the majority of spineflower individuals observed in 2003 occurs between 1,120 and 1,200 feet AMSL. The proposed preserve areas include 84% of the individuals observed in those elevations in 2003. The majority of area occupied by spineflowers in 2003 occurred between 1,080 and 1,200 feet AMSL. The proposed preserve area would conserve 82% of this area. The other elevation categories account for less than 1% to 10% of the 2003 individuals and area occupied. Conservation in these categories ranges from 28% to 100%.

Table 9A
Spineflower Occurrence by Elevation, 2003

Number of Individuals						
Elevation (in feet AMSL)	**Individuals in Study Area**	**Percent of Existing Population**	**Preserved**	**Not Preserved**	**Preserved Population as Percent of Existing Population**	**Percent Conserved by Elevation**
960-1,000	31,672	0.53	31,449	223	0.53	99.30
1,000-1,040	342,801	5.79	213,858	128,943	3.61	62.39
1,040-1,080	280,617	4.74	102,626	177,991	1.73	36.57
1,080-1,120	582,909	9.84	451,079	131,830	7.62	77.38
1,120-1,160	1,584,270	26.75	1,466,684	117,586	24.77	92.58
1,160-1,200	1,913,101	32.31	1,485,030	428,071	25.08	77.62
1,200-1,240	621,388	10.49	428,579	192,809	7.24	68.97
1,240-1,280	478,184	8.08	431,684	46,500	7.29	90.28
1,280-1,320	86,558	1.46	86,558	0	1.46	100.00
Total	**5,921,500**	**100%**	**4,697,547**	**1,223,953**	**79.33%**	

Table 9A
Spineflower Occurrence by Elevation, 2003

Number of Acres						
Elevation (in feet AMSL)	Acres in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Elevation
960-1,000	0.16	0.98	0.15	0.01	0.92	93.75
1,000-1,040	1.61	9.85	1.10	0.52	6.73	68.32
1,040-1,080	1.01	6.18	0.61	0.40	3.73	60.40
1,080-1,120	3.06	18.72	2.66	0.40	16.27	86.93
1,120-1,160	5.21	31.87	4.74	0.47	28.99	90.98
1,160-1,200	3.06	18.72	1.90	1.16	11.62	62.09
1,200-1,240	1.50	9.17	0.42	1.08	2.57	28.00
1,240-1,280	0.65	3.98	0.36	0.29	2.20	55.38
1,280-1,320	0.09	0.55	0.09	0	0.55	100
Total	**16.35**	**100%**	**12.02**	**4.33**	**73.58%**	

The majority of spineflower individuals and occupied area observed in 2005 were located between 1,080 and 1,200 feet AMSL, although the distribution shifted slightly towards lower elevations, with a large increase in individuals observed between 1,080 and 1,120 feet, and a decrease in individuals observed over 1,200 feet. Between 1,080 and 1,200 feet, 89% of individuals and 81% of the area would be conserved. The remaining categories range from less than 1% to 5% of the spineflower individuals and less than 1% to 10% of area, with conservation of 0% to 100%.

Table 9B
Spineflower Occurrence by Elevation

Number of Individuals						
Elevation	Individuals in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Elevation
960-1,000	35,665	0.49	26,294	9,371	0.36	73.72
1,000-1,040	327,264	4.53	195,866	131,398	2.71	59.85
1,040-1,080	222,043	3.05	56,669	165,374	0.78	25.52
1,080-1,120	1,519,807	21.05	1,373,130	146,677	19.02	90.35
1,120-1,160	2,879,648	39.88	2,650,027	229,621	36.70	92.03
1,160-1,200	1,665,452	23.07	1,356,513	308,939	18.79	81.45

Table 9B
Spineflower Occurrence by Elevation

1,200-1,240	291,108	4.03	87,240	203,868	1.21	29.97
1,240-1,280	212,331	2.94	118,840	93,491	1.65	55.97
1,280-1,320	18,315	0.25	18,315	0	0.25	100.00
1,320-1,360	28	0.00	0	28	0.00	0.00
1,360-1,400	243	0.00	0	243	0	0.00
1,400-1,440	48,481	0.67	0	48,481	0	0.00
Total	**7,220,385**	**100.00%**	**5,882,894**	**1,337,491**	**81.47%**	

Number of Acres

Elevation	Acres in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Elevation
960-1,000	0.10	0.88	0.09	0.01	0.79	90.00
1,000-1,040	1.06	9.29	0.66	0.41	5.78	62.26
1,040-1,080	0.70	6.13	0.24	0.46	2.10	34.29
1,080-1,120	1.87	16.39	1.48	0.39	12.97	79.14
1,120-1,160	3.75	32.87	3.37	0.38	29.54	89.87
1,160-1,200	2.40	21.03	1.61	0.79	14.11	67.08
1,200-1,240	0.89	7.80	0.20	0.69	1.75	22.47
1,240-1,280	0.50	4.38	0.27	0.24	2.37	54.00
1,280-1,320	0.05	0.44	0.05	0	0.44	100
1,320-1,360	0.001	0.01	0	0.001	0	0
1,360-1,400	0.01	0.09	0	0.01	0	0
1,400-1,440	0.08	0.70	0	0.08	0	0
Total	**11.41**	**100.00%**	**7.96**	**3.45**	**69.85%**	

As depicted in *Table 10A*, 2003 spineflower occurrences overlap nine geologic strata. The most common geologic substrate for spineflower occurrence is Quaternary terrace deposits, accounting for 58% of the 2003 spineflower individuals and 54% of the area; 85% of this area would be conserved, accounting for 90% of the individuals occupying this geologic substrate. Quaternary landslide and Quaternary older alluvium account for 17% (100% conservation) and 9% (6% conservation) of the 2003 spineflower individuals, respectively. The remaining geology substrates vary from less than 1% to 5% of the spineflower individuals and less than 1% to 15% of occupied area, with a conservation rate of 7% to 100% of individuals and 26% to 100% of area.

The most common geologic substrate where the spineflower was found in 2005 was in the Quaternary terrace deposits (*Table 10B*). Over 80% of the total individuals observed in 2005

were found over these deposits, and 89% of those individuals would be conserved. The remaining geologic categories account for less than 1% to 6% of the total individuals observed in 2005. Between 30% and 100% of individuals and 10% to 100% of area observed within these eight geologic layers will be conserved within the proposed preserve areas.

Table 10A
Spineflower Occurrence by Geology, 2003

Number of Individuals						
Geology Type	**Individuals in Study Area**	**Percent of Existing Population**	**Preserved**	**Not Preserved**	**Preserved Population as Percent of Existing Population**	**Percent Conserved by Geology**
Artificial Fill	14,725	0.25	8,468	6,257	0.14	57.51
Quaternary Alluvium	83,944	1.41	69,955	13,989	1.18	83.34
Quaternary Landslide	1,001,463	16.84	999,459	2,004	16.81	99.80
Quaternary Older Alluvium	543,387	9.14	31,028	512,359	0.52	5.71
Quaternary Slopewash	83,283	1.4	83,283	0	1.40	100.00
Quaternary Terrace Deposits	3,439,265	57.83	3,101,079	338,186	52.14	90.17
Undifferentiated Pico Formation	189,243	3.18	161,539	27,704	2.72	85.36
Undifferentiated Saugus Formation	308,365	5.19	249,678	58,687	4.20	80.97
Upper Member of Saugus Formation	283,413	4.77	18,644	264,769	0.31	6.58
Total	**5,947,088**	**100%**	**4,723,133**	**1,223,955**	**79.42%**	
Number of Acres						
Geology Type	**Acres in Study Area**	**Percent of Existing Population**	**Preserved**	**Not Preserved**	**Preserved Population as Percent of Existing Population**	**Percent Conserved by Geology**
Artificial Fill	0.03	0.18	0.015	0.018	0.09	50.0
Quaternary Alluvium	0.77	4.71	0.45	0.31	2.75	58.44
Quaternary Landslide	1.74	10.64	1.71	0.02	10.45	98.28
Quaternary Older Alluvium	0.72	4.40	0.12	0.61	0.73	16.67
Quaternary Slopewash	0.17	1.04	0.17	0	1.04	100
Quaternary Terrace Deposits	8.87	54.22	7.54	1.32	46.09	85.01
Undifferentiated Pico Formation	0.59	3.61	0.54	0.05	3.30	91.53
Undifferentiated Saugus Formation	1.09	6.66	0.86	0.23	5.26	78.90
Upper Member of Saugus Formation	2.39	14.61	0.63	1.76	3.85	26.36
Total	**16.36**	**100%**	**12.04**	**4.32**	**73.56%**	

Table 10B
Spineflower Occurrence by Geology, 2005

Number of Individuals						
Geology Type	**Individuals in Study Area**	**Percent of Existing Population**	**Preserved**	**Not Preserved**	**Preserved Population as Percent of Existing Population**	**Percent Conserved by Geology**
Artificial Fill	228	0.00	226	2	0.00	99.12
Quaternary Alluvium	123,876	1.80	53,676	70,200	0.78	43.33
Quaternary Landslide	122,604	1.78	121,045	1,559	1.76	98.73
Quaternary Older Alluvium	393,374	5.72	114,576	278,798	1.67	29.13
Quaternary Slopewash	65,340	0.95	65,340	0	0.95	100.00
Quaternary Terrace Deposits	5,857,436	85.22	5,227,521	629,915	76.05	89.25
Undifferentiated Pico Formation	51,858	0.75	44,586	7,272	0.65	85.98
Undifferentiated Saugus Formation	258,841	3.77	227,590	31,251	3.77	87.93
Total	**7,223,062**	**100%**	**588,585**	**1,337,204**	**85.63%**	
Number of Acres						
Geology Type	**Acres in Study Area**	**Percent of Existing Population**	**Preserved**	**Not Preserved**	**Preserved Population as Percent of Existing Population**	**Percent Conserved by Geology**
Artificial Fill	0.01	0.09	0.01	0	0.09	100
Quaternary Alluvium	0.56	4.91	0.21	0.35	1.84	37.5
Quaternary Landslide	1.22	10.70	1.21	0.01	10.61	99.18
Quaternary Older Alluvium	0.53	4.65	0.05	0.48	0.44	9.43
Quaternary Slopewash	0.08	0.70	0.08	0	0.70	100
Quaternary Terrace Deposits	6.48	56.84	5.27	1.21	46.23	81.33
Undifferentiated Pico Formation	0.36	3.16	0.31	0.05	2.72	86.11
Undifferentiated Saugus Formation	0.67	5.88	0.48	0.20	4.21	71.64
Upper Member of Saugus Formation	1.49	13.07	0.35	1.15	3.07	23.49
Total	**11.42**	**100%**	**7.97**	**3.45**	**69.91%**	

As described in *Tables 11A and 11B*, the majority of spineflower observed in 2003 and 2005 occurred on slopes of 20% or less. In 2003, 92% of the individuals and 94% of the occupied area occurred on slopes of less than 20%. In 2005, the number of individuals was 98% and the occupied area was 93% on slopes of less than 20%. The proposed preserve area would conserve 78% of individuals in 2003 and 81% in 2005 on slopes less than 20%. The preserves would conserve 72% and 68% of the occupied area in these categories in 2003 and 2005, respectively. The three remaining slope ranges represented 8% of spineflower individuals in 2003 and 2% in 2005. The remaining slopes accounted for 6% and 7% of the total occupied area in 2003 and 2005, respectively. The proposed preserves would conserve 79% of the individuals and 73% of the area of the 2003 populations and 81% of individuals and 70% of the occupied area of the 2005 populations.

Table 11A
Spineflower Occurrence by Slope, 2003

Number of Individuals						
% Slope	Individuals in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Slope
0-5	1,238,123	20.91	783,973	454,150	13.24	63.32
5-10	1,655,734	27.96	1,139,945	515,789	19.25	68.85
10-15	902,385	15.24	706,710	195,675	11.93	78.32
15-20	1,631,386	27.55	1,577,111	54,275	26.63	96.67
20-25	483,907	8.17	479,851	4,056	8.10	99.16
25-30	6,747	0.11	6,742	5	0.11	99.93
30-35	3,216	0.05	3,216	0	0.05	100.00
Total	**5,921,498**	**100%**	**4,697,548**	**1,223,950**	**79.31%**	
Number of Acres						
% Slope	Acres in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Slope
0-5	3.79	23.17	2.59	1.20	15.83	68.34
5-10	5.45	33.33	3.63	1.82	22.19	66.61
10-15	2.78	16.99	1.81	0.98	11.06	65.11
15-20	3.29	20.11	3.04	0.25	18.58	92.40
20-25	0.99	6.05	0.90	0.09	5.50	90.91
25-30	0.04	0.24	0.04	0	0.24	100
30-35	0.01	0.06	0.01	0	0.06	100
Total	**16.36**	**100%**	**12.02**	**4.34**	**73.46%**	

Table 11B
Spineflower Occurrence by Slope, 2005

Number of Individuals						
% Slope	Individuals in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Slope
0-5	1,940,456	26.87	1,650,135	290,321	22.85	85.04
5-10	1,791,850	24.82	1,431,187	360,663	19.82	79.87
10-15	2,123,478	29.41	1,515,202	608,276	20.99	71.35
15-20	1,216,192	16.84	1,160,135	56,057	16.07	95.39
20-25	128,879	1.78	114,645	14,234	1.59	88.96
25-30	19,473	0.27	11,533	7,940	0.16	59.23
30-35	56	0.00	56	0	0.00	100.00
Total	**7,220,384**	**100%**	**5,882,893**	**1,337,491**	**81.48%**	
Number of Acres						
% Slope	Individuals in Study Area	Percent of Existing Population	Preserved	Not Preserved	Preserved Population as Percent of Existing Population	Percent Conserved by Slope
0-5	2.94	25.77	1.98	0.96	17.35	67.35
5-10	3.71	32.51	2.18	1.53	19.11	58.76
10-15	1.94	17.00	1.22	0.71	10.69	62.89
15-20	2.01	17.62	1.83	0.18	16.04	91.04
20-25	0.77	6.75	0.71	0.05	6.22	92.21
25-30	0.04	0.35	0.03	0.01	0.26	75.00
30-35	0.002	0.02	0.002	0	0.02	100
Total	**11.41**	**100%**	**7.95**	**3.44**	**69.69%**	

As described in *Table 12A,* the majority of spineflower observed in 2003 occurred on slopes facing southwest, southeast, west, and east. The proposed preserve areas would conserve 85% of the individuals and 78% of the occupied area on slopes with these aspects. The remaining five aspect categories represent between less than 1% and 10% of the total spineflower individuals and 11% or less of the occupied area. Between 43% and 96% of individuals and 26% and 94% of area in these remaining five aspect categories would be included within the preserve areas.

Table 12A
Spineflower Occurrence by Aspect, 2003

Number of Individuals						
Aspect	**Individuals in Study Area**	**Percent of Existing Population**	**Preserved**	**Not Preserved**	**Preserved Population as Percent of Existing Population**	**Percent Conserved by Aspect**
East	739,109	12.48	646,038	93,071	10.91	87.41
Flat	535,521	9.04	250,545	284,976	4.23	46.79
North	56,851	0.96	54,625	2,226	0.92	96.08
Northeast	237,261	4.01	102,199	135,062	1.73	43.07
Northwest	319,825	5.40	218,138	101,687	3.68	68.21
South	163,014	2.75	134,867	28,147	2.28	82.73
Southeast	1,295,734	21.88	1,018,739	276,995	17.20	78.62
Southwest	1,515,453	25.59	1,254,906	260,547	21.19	82.81
West	1,058,730	17.88	1,017,486	41,244	17.18	96.10
Total	**5,921,498**	**100%**	**4,697,543**	**1,223,955**	**79.32**	
Number of Acres						
Aspect	**Acres in Study Area**	**Percent of Existing Population**	**Preserved**	**Not Preserved**	**Preserved Population as Percent of Existing Population**	**Percent Conserved by Aspect**
East	1.73	10.58	1.20	0.53	7.34	69.36
Flat	0.91	5.57	0.54	0.37	3.30	59.34
North	0.48	2.94	0.45	0.03	2.75	93.75
Northeast	0.65	3.98	0.17	0.49	1.04	26.15
Northwest	1.74	10.64	1.25	0.48	7.65	71.84
South	0.96	5.87	0.60	0.36	3.67	62.50
Southeast	3.43	20.98	2.05	1.38	12.54	59.77
Southwest	3.34	20.43	2.91	0.43	17.80	87.13
West	3.11	19.02	2.84	0.27	17.37	91.32
Total	**16.35**	**100%**	**12.02**	**4.33**	**73.46%**	

As described in *Table 12B,* the majority of spineflower individuals observed in 2005 occurred on slopes facing west, southwest, and northwest. Between 91% and 99% of individuals observed in these aspects would be included within the proposed preserve areas. The remaining six aspect categories represent between 2% and 4% of the total spineflower occurrences. Between 14% and 99% of individuals observed in 2005 in these remaining six aspect categories would be

included within the preserve areas. The area occupied by SFVS in 2005 was similar to that in 2003, with only slight differences in the percent of occurrence.

In 2005, the majority of occupied area occurred on slopes facing east, southeast, southwest, and west. The proposed preserves would conserve 75% of the area in these aspect categories.

Table 12B
Spineflower Occurrence by Aspect, 2005

Number of Individuals						
Aspect	**Individuals in Study Area**	**Percent of Existing Population**	**Preserved**	**Not Preserved**	**Preserved Population as Percent of Existing Population**	**Percent Conserved by Aspect**
East	327,752	4.54	128,060	199,692	1.77	39.07
Flat	434,706	6.02	285,732	148,974	3.96	65.73
North	179,980	2.49	178,343	1,637	2.47	99.09
Northeast	384,937	5.33	52,640	332,297	0.73	13.67
Northwest	815,402	11.29	784,226	31,176	10.86	96.18
South	282,767	3.92	131,028	151,739	1.81	46.34
Southeast	548,264	7.59	263,001	285,263	3.64	47.97
Southwest	1,807,438	25.03	1,651,303	156,135	22.87	91.36
West	2,439,134	33.78	2,408,558	30,576	33.36	98.75
Total	**7,220,380**	**100%**	**5,882,891**	**1,337,489**	**81.48%**	
Number of Acres						
Aspect	**Acres in Study Area**	**Percent of Existing Population**	**Preserved**	**Not Preserved**	**Preserved Population as Percent of Existing Population**	**Percent Conserved by Aspect**
East	1.19	10.43	0.78	0.41	6.84	65.55
Flat	0.70	6.13	0.46	0.24	4.03	65.71
North	0.38	3.33	0.35	0.02	3.07	92.11
Northeast	0.53	4.65	0.08	0.45	0.70	15.09
Northwest	1.14	9.99	0.81	0.33	7.10	71.05
South	0.77	6.75	0.34	0.43	2.98	44.16
Southeast	2.33	20.42	1.52	0.81	13.32	65.24
Southwest	2.08	18.23	1.63	0.45	14.29	78.37
West	2.29	20.07	1.98	0.31	17.35	86.46
Total	**11.41**	**100%**	**7.86**	**3.45**	**69.68**	

The level of conservation across the environmental conditions described in the above tables (*Tables 7A* to *12B*) is considered to address a primary goal of this plan, which is to provide for the long-term persistence of spineflower within the project study area, and, in particular, this level of conservation addresses objective 3, as described in *Section 3.0*.

7.3 Accommodating Population Fluctuation within Preserve Areas

The proposed preserve areas contain additional habitat not currently known to be occupied by spineflower populations over the last five growing seasons. Unoccupied acreage includes buffer areas and areas between spineflower polygons, which may or may not be suitable habitat. Where the surrounding habitats are suitable, spineflower expansion can potentially occur. *Table 13* depicts the acreage occupied by SFVS, as well as the available unoccupied acreage, in the preserves in 2003, 2005, and the total footprint from all surveyed years.

Table 13
Area Occupied by SFVS within Preserves in Acres

	2003		2005		Total Footprint	
Preserve	**Occupied**	**Unoccupied**	**Occupied**	**Unoccupied**	**Occupied**	**Unoccupied**
Airport Mesa	4.6	40.4	2.9	42.1	5.2	39.8
Grapevine Mesa	3.5	40.6	2.3	41.8	4.0	40.1
Entrada	0.8	25.8	0.7	25.8	1.0	25.6
Potrero	1.2	13.6	0.7	14.1	1.3	13.5
San Martinez	2.1	32.3	1.4	33.0	2.3	32.1
Total	**12.2**	**152.7**	**8.0**	**156.8**	**13.8**	**151.1**

[1] Column will not total exactly due to rounding.

As described in *Section 7.1*, it is not possible at this time to identify suitable habitat for the spineflower, based on the unsatisfactory results of the HSI, which utilized currently available information. Further analysis is needed to better characterize the spineflower's physical and biological habitat requirements at a fine scale. This analysis will be undertaken pursuant to future monitoring data collected as described in *Section 10.0.*

Monitoring described in *Section 10.0* will assist in documenting population expansion events. Management described in *Section 9.3* is intended to reduce weed cover and annual grass buildup, which should improve growing conditions within the preserve, creating opportunities for population expansion. Restoration of damaged, cultivated, or disked habitats, which may have

previously supported spineflower, is planned for some locations and could allow future population expansion if conditions suitable for spineflower can be created.

7.4 Connectivity between the Preserve Areas

Figure 13 depicts the five preserve areas in relation to open space areas. The Potrero and Grapevine Mesa preserves each connect to the Santa Clara River corridor through lands designated as open areas. The Airport Mesa preserve connects to Open Area via a wildlife movement arched culvert under GG street. There is no direct connectivity linking the San Martinez Grande preserve to natural habitat areas. A 50- to 100-foot-wide band of proposed development along San Martinez Grande Road separates the San Martinez Grande Preserve from a narrow open area located east of the road along the stream corridor. It is not known whether pollinators or dispersal agents will be able to cross developed lands to reach this preserve area.

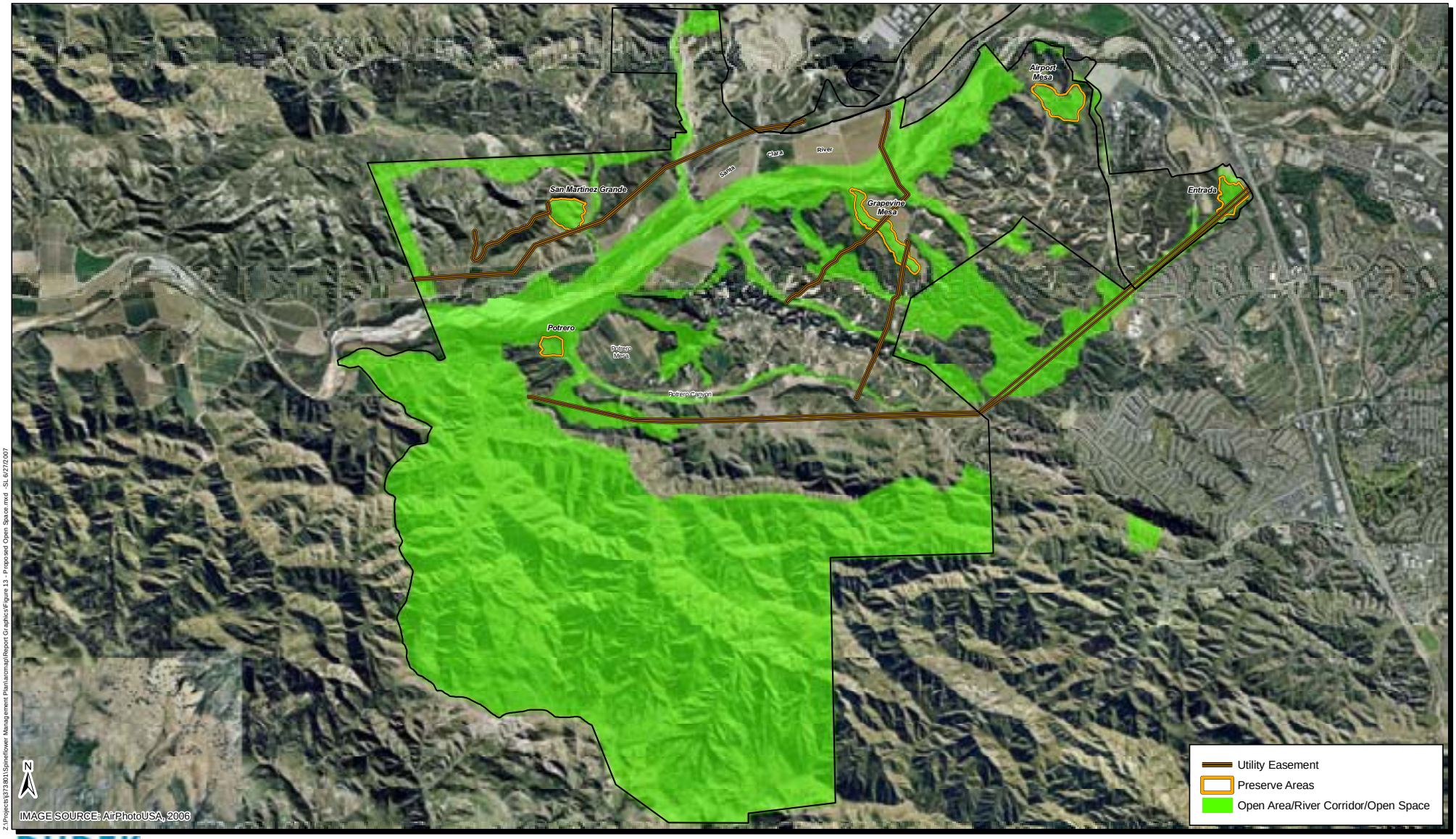
The Entrada preserve is connected to a 175-foot-wide utility easement corridor that runs southwest toward the off-site Legacy open space area, which, in turn, connects to the Newhall Ranch open space areas and the Santa Clara River corridor.

Open areas may include undeveloped land, passive and active use parks, and trails. Development plans are not currently available for open areas, and, therefore, open area land uses adjacent to the proposed spineflower preserves are not known at this time.

8.0 DESCRIPTION OF THE PRESERVES

This section provides a discussion of the proposed preserve areas, including location, size, and setting; the number and distribution of occurrences; and various ecological indicators, such as aspect, slope, soils, vegetation, and pollinators present.

The proposed Airport Mesa, Grapevine Mesa, Potrero, San Martinez Grande, and Entrada preserve areas would conserve spineflower locations at five out of the six known occurrences within Newhall Land property holdings in the project study area. The five preserve areas total approximately 164.8 acres and include approximately 80% of spineflower observed in 2003 and 2005 and more than 90% of spineflower observed in 2004. Spineflower occurrences known from the VCC planning area, which accounted for approximately 3% of all spineflower observed at Newhall Land in 2003, 2004, and 2005, would not be conserved.



Z:\Projects\373801\Spineflower Management Plan\arcmap\Report Graphics\Figure 13 - Proposed Open Space.mxd -SL 6/27/2007

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Proposed Open Space

FIGURE 13

The sections below include a general evaluation of the potential for spineflower within each preserve area. *Figures 14* through *18* depict the proposed preserve areas with existing vegetation and 2003 and 2005 spineflower distributions.

8.1 Airport Mesa Preserve Area

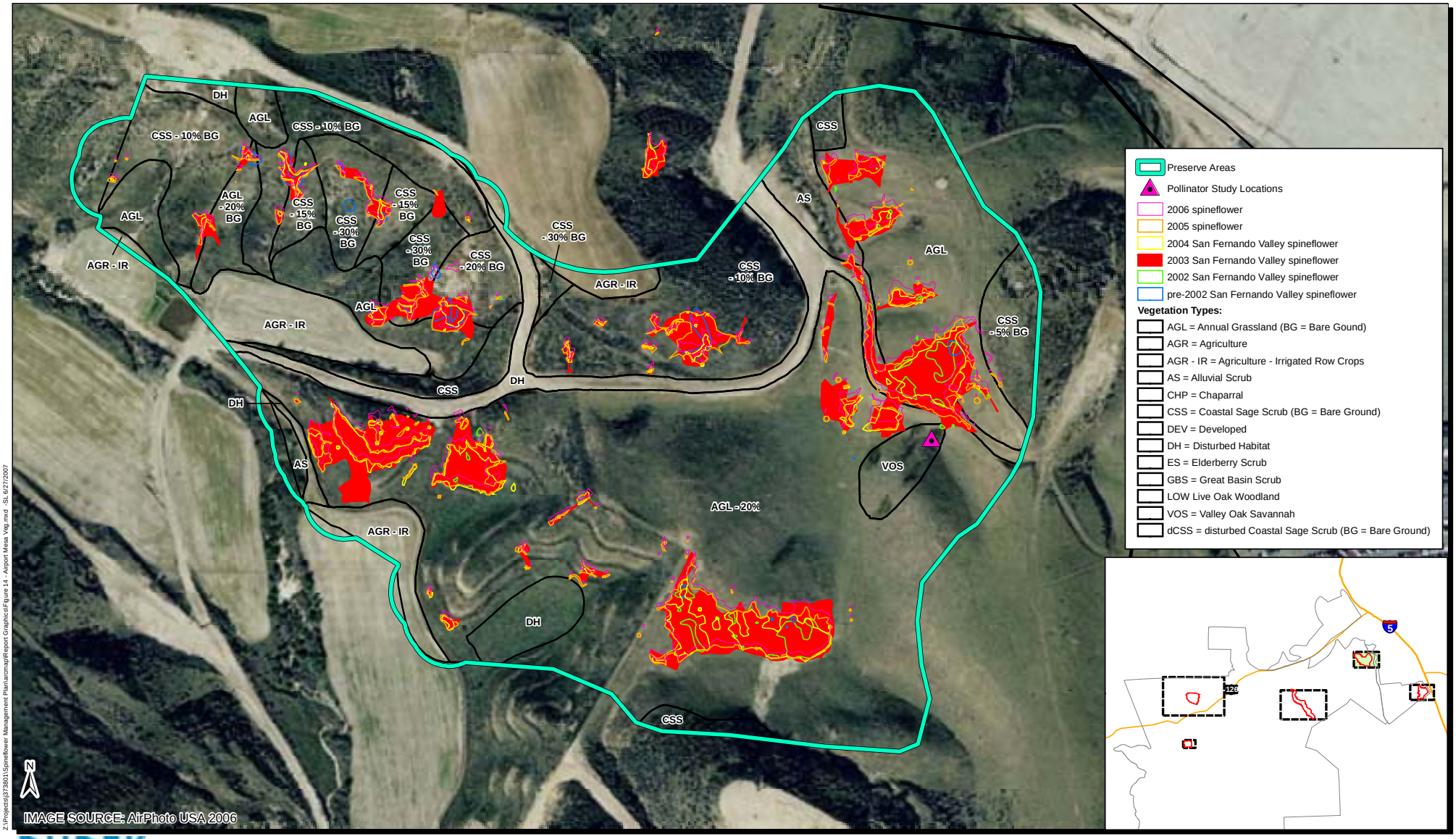
The Airport Mesa Preserve Area is located toward the eastern end of the NRSP, to the west of the Six Flags Magic Mountain Amusement Park and south of the Santa Clara River (*Figure 14*). The preserve includes 45 acres dominated by California annual grassland and California sagebrush scrub communities along south- and west-facing slopes surrounding Airport Mesa. The preserve extends along the north side of Middle Canyon to the existing gated access road on the east side of the mesa.

Occurrence Data

Occurrence data are provided in *Table 14*. In 2003, there were approximately 807,591 spineflower individuals (14% of the total within Newhall Land as a whole) occupying 4.6 acres within the Airport Mesa Preserve Area. Considerably more spineflower individuals were observed in 2005, with 1,335,740 individuals occupying 2.9 acres within the preserve area. This reflects an increase of about 65% over the 2003 numbers and represents 18% of the total within Newhall Land as a whole.

Table 14
Vegetation Communities and Land Covers within the Airport Mesa Preserve Area (2003 and 2005)

Vegetation Type	Acres	Individuals 2003	Individuals 2005	% Change
California annual grassland	26.65	508,032	960,424	89.0%
California sagebrush scrub	11.30	135,321	194,061	43.4%
Disturbed land	3.28	159,268	180,492	13.3%
Agricultural land	2.42	0	0	N/A
Alluvial scrub	0.80	4,351	763	-82.5%
Valley oak grassland	0.56	619	0	-100.0%
TOTAL	**45.01**	**807,591**	**1,335,740**	**65.4%**



Z:\Projects\373801\Spineflower Management Plan\arcmap\Report Graphics\Figure 14 - Airport Mesa Veg.mxd - SL 6/27/2007

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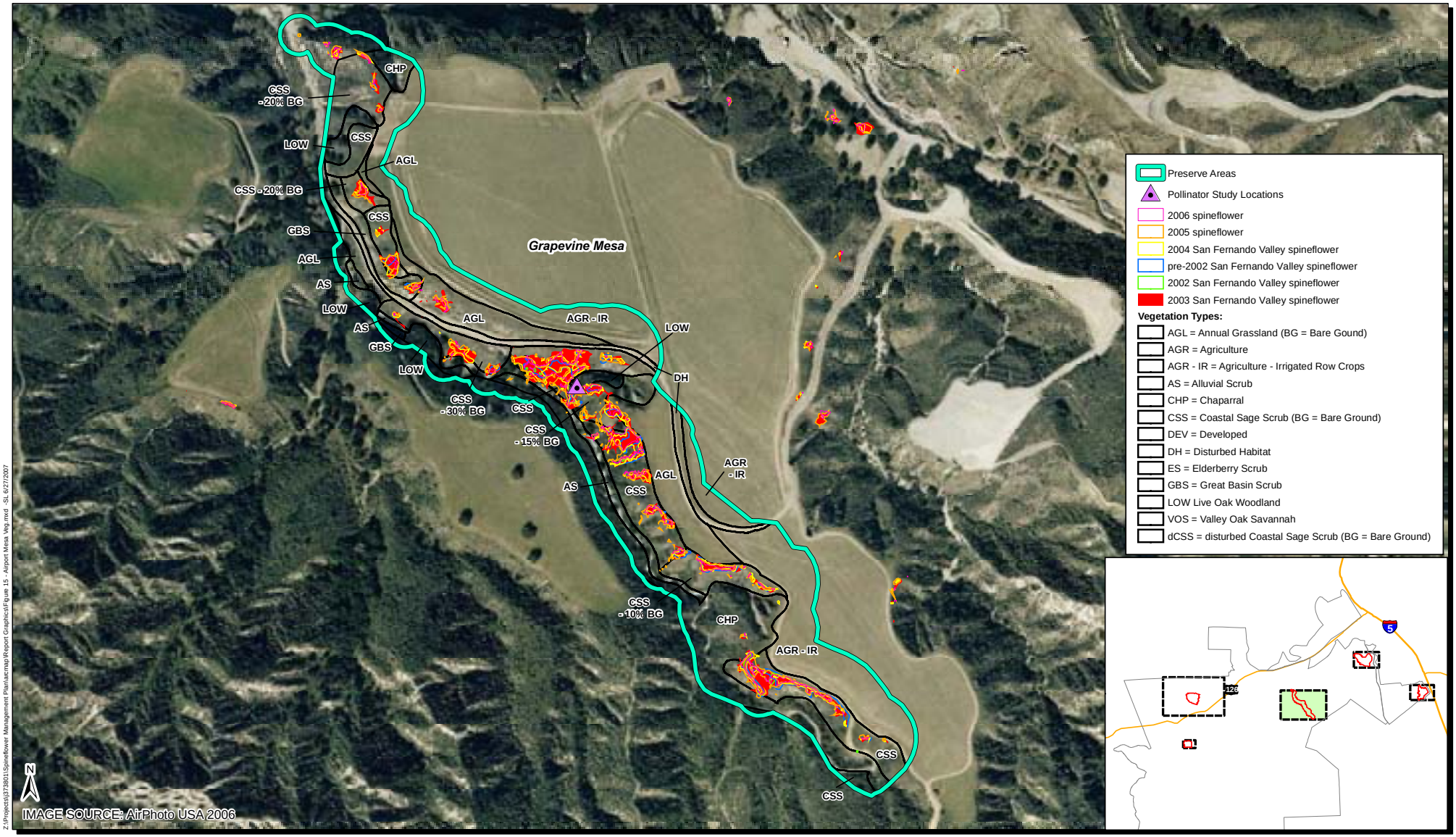
Airport Mesa Preserve Area with Existing Vegetation

FIGURE 14



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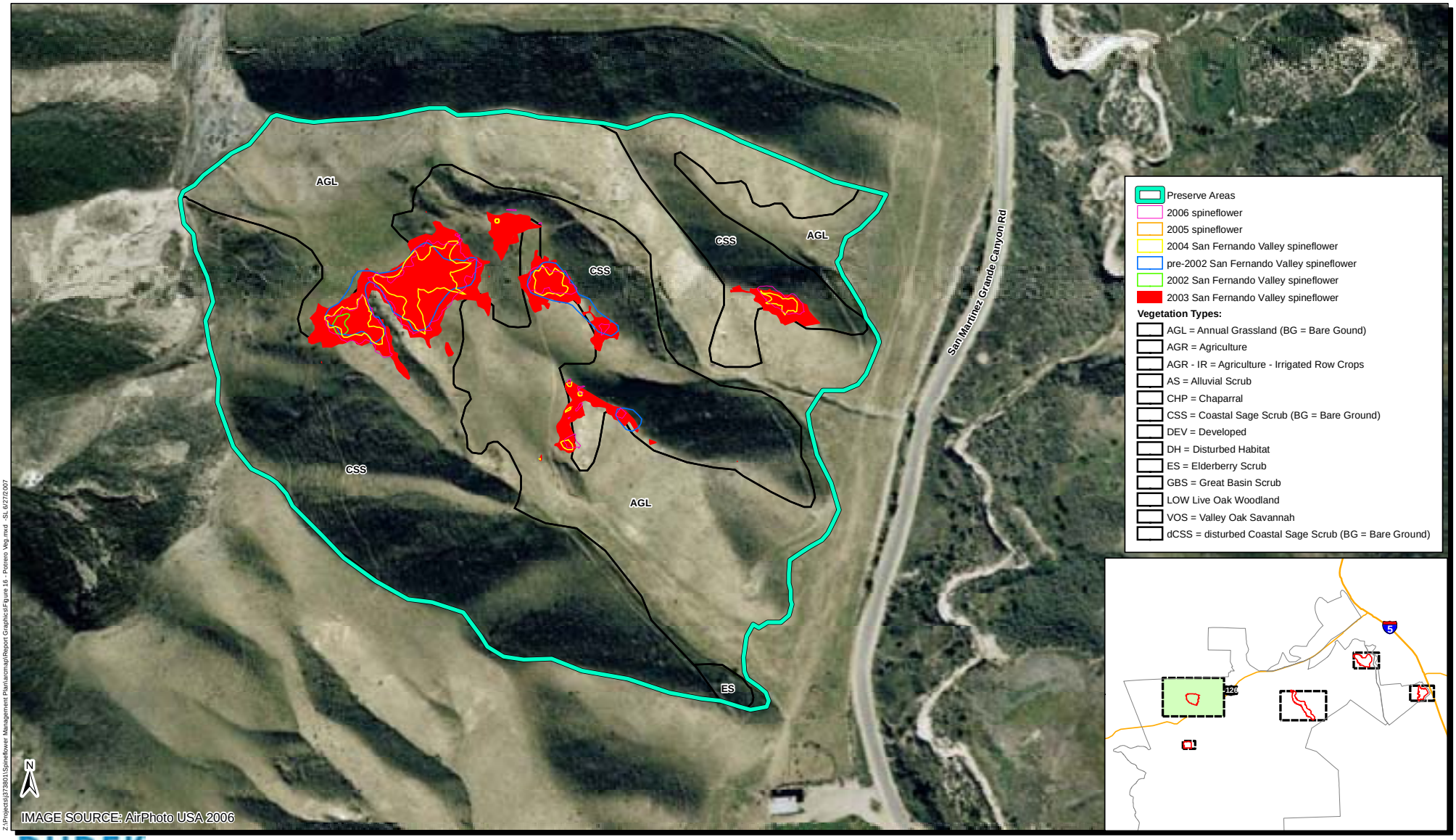
Grapevine Mesa Preserve Area with Existing Vegetation

FIGURE 15



Z:\Projects\373801\Spineflower Management Plan\arcmap\Report Graphics\Figure 16 - Potrero Veg.mxd - SL 6/27/2007

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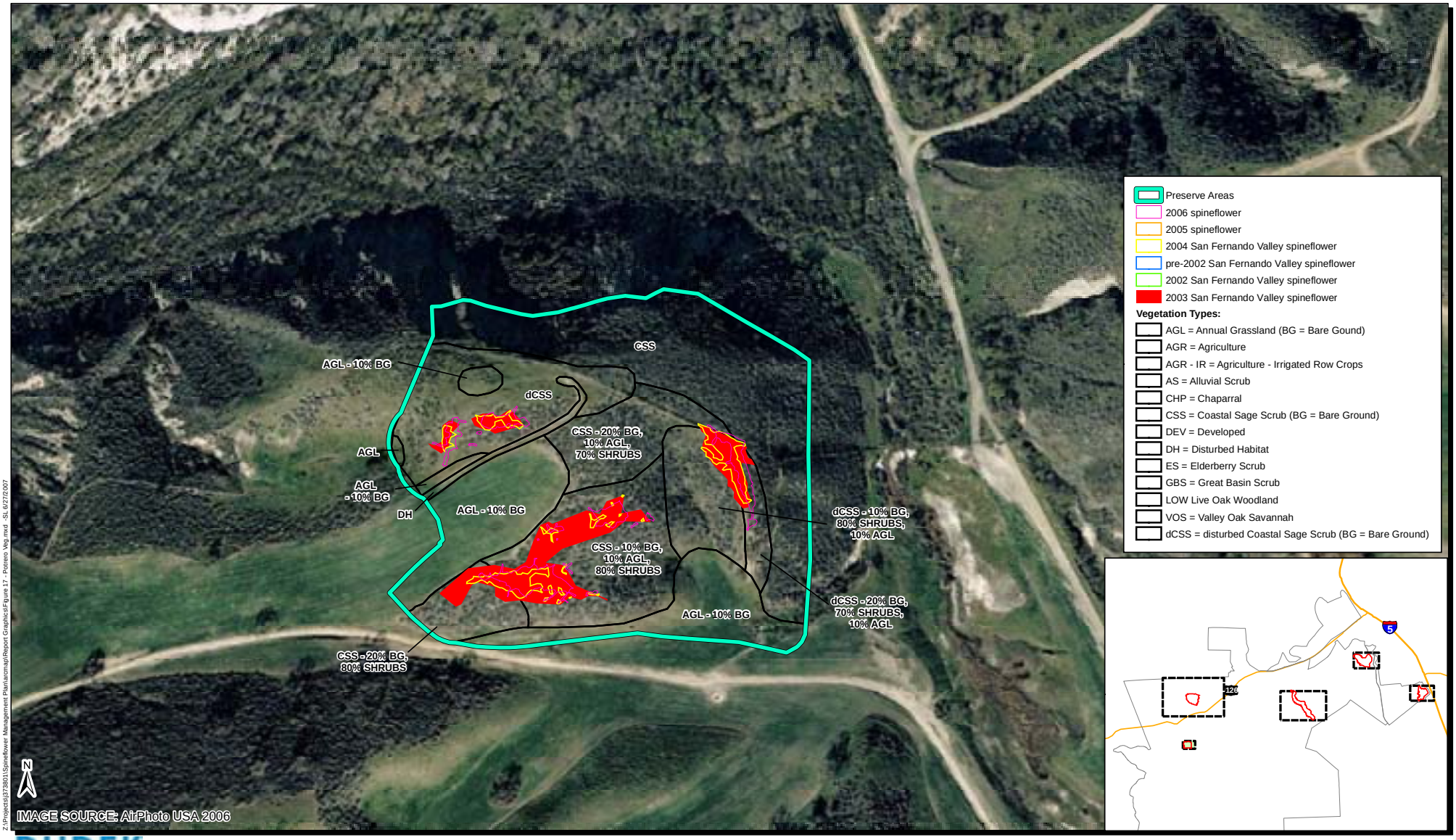
San Martinez Grande Preserve Area with Existing Vegetation

FIGURE 16



Z:\Projects\373801\Spineflower Management Plan\arcmap\Report Graphics\Figure 17 - Potrero Veg.mxd - SL 6/27/2007

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Potrero Preserve Area with Existing Vegetation

FIGURE 17

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Magic Mountain Preserve Area with Existing Vegetation

FIGURE 18

Ecological Indicators (Vegetation, Soils, Geology, Slope, Aspect, Elevation)

California annual grassland and California sagebrush scrub are the dominant vegetation communities within the Airport Mesa Preserve Area. There are approximately 11.30 acres of California sagebrush scrub and approximately 26.65 acres of California annual grassland. Although California sagebrush scrub and California annual grassland are generally the primary habitat for spineflower, it does occur in fairly high numbers within areas that experienced surface grubbing and/or mass soil grading in the recent past, and seed bank was presumably present in the vicinity prior to disturbance. Spineflower also occurs on the margins of infrequently used dirt roadbeds, especially where populations occur upslope and are producing seed. To a lesser extent, spineflower occurs in alluvial scrub and valley oak grassland. Other vegetation communities and land covers within the Airport Mesa Preserve Area include agricultural land; no spineflower occurrences were recorded on such land in 2003 or 2005.

Vegetation communities and recorded individual spineflower occurrences from 2003 and 2005 within the Airport Mesa Preserve Area are listed in *Table 14*. Although more spineflower occurrences were recorded in 2005, those increases occurred predominantly in the California annual grassland vegetation community. In contrast, there were considerably fewer spineflower recorded in the alluvial scrub and valley oak grassland vegetation communities in 2005 than in 2003. Agricultural land and disturbed land will be restored as described in *Section 10.3*.

The Airport Mesa Preserve Area soils include Castaic-Balcom silty clay loams (30% to 50% slopes), terrace escarpments, and Hanford sandy loam (2% to 9% slopes). Out of the three geologic units that occur within the Newhall Land project study area, two are present within the Airport Mesa Preserve Area: **(1)** alluvium (mostly Holocene, some Pleistocene) Quaternary non-marine and marine and **(2)** Plio-Pleistocene non-marine, Pliocene non-marine.

Slopes within the Airport Mesa Preserve Area are gentle to moderate, with 91% of the preserve area occurring on slopes less than 10° and 100% of the preserve area occurring on slopes less than 20°. Approximately 78% of the slopes in the preserve area have a southwest-, northwest-, or west-facing aspect. Elevations range from 1080 to 1160 feet AMSL.

Adjacent Land Uses

The areas surrounding the Airport Mesa Preserve Area (*Figure 19*) have historically been used for agriculture (irrigated row crops and dry-farmed row crops) and grazing. Currently, adjacent

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Airport Mesa Preserve Area with Adjacent Land Use

FIGURE 19

land uses include staging for agricultural operations on the graded mesa-top above the preserve area and active cultivation in the canyon bottom below the preserve area. Open space along the Santa Clara River corridor is located to the north of the preserve area, while the Six Flags Magic Mountain Theme Park is located to the southeast of the preserve area. Planned land uses adjacent to the Airport Mesa Preserve Area include mixed use primarily to the north and south, and high density residential development to the southwest of the preserve area. Undeveloped areas along the Santa Clara River corridor northwest of the preserve area would remain in open space, as would open space areas to the east and northeast. The preserve will be connected to open space by a culvert under Street GG.

Buffer Areas within Airport Mesa Preserve Area

Where the Airport Mesa Preserve Area is adjacent to development, spineflower occurrences would generally be separated from development by 80 to 200 feet or more. Where the preserve would be upslope of the adjacent mixed-use development, the distance from the nearest spineflower occurrence to the preserve boundary is approximately 80 feet. Where the preserve would be downslope of the adjacent mixed-use development, the distance from the nearest spineflower occurrence to the preserve boundary varies from 80 to 200 feet or more. Management measures described in *Section 9.0*, in combination with these buffer widths, are intended to address various risk factors from adjacent changes in land use and contribute to a primary goal of this plan, which is to provide for the long-term persistence of spineflower within the project study area.

Pollinators Present

Flies and beetles were the dominant visitors to spineflower populations at Airport Mesa during the mid-season survey (April 23-25, 2004). There were 633 visits during the mid-season survey. Flies, ants, and beetles were the dominant visitors during the late-season survey (May 7-9, 2004). There were 372 visits during the late-season survey. However, insect visitors to spineflower populations were very diverse at all three survey locations (Airport Mesa, Grapevine Mesa, and Entrada) and reflected the relative abundance of insects in the community (Jones et al. 2004). Seven orders of insects were observed visiting spineflower populations, including Hymenoptera (bees and ants), Coleoptera (beetles), Homoptera (cicadas), Diptera (flies), Hemiptera (true bugs), Mantodea (mantids), and Lepidoptera (moths). The California sagebrush scrub, alluvial scrub, Valley oak grassland, and California annual grassland within the preserve may continue to provide habitat for the above-described insects, especially flies, ants, and beetles.

8.2 Grapevine Mesa Preserve Area

The Grapevine Mesa Preserve Area encompasses 44.1 acres dominated by agricultural land (irrigated row crops), California sagebrush scrub, and chaparral on south- and west-facing slopes along the western margin of Grapevine Mesa (*Figure 15*). The preserve varies in width from approximately 250 to 600 feet and is 1 mile in length, extending from the Santa Clara River in the north to the southern end of Grapevine Mesa. The eastern margin of the preserve area includes agricultural lands along the mesa-top, but the majority of the preserve area occurs on slopes surrounding the mesa that are dominated by California sagebrush scrub and chaparral. An unnamed drainage to the Santa Clara River occurs in the canyon bottom along the western boundary of the preserve area. The agricultural land and disturbed land will be restored as described below in accordance with *Section 10.3*.

Occurrence Data

Occurrence data are provided in *Table 15*. In 2003, there were approximately 1,833,086 spineflower individuals (31% of the total within Newhall Land as a whole) occupying 3.5 acres within the Airport Mesa Preserve Area. In 2005, there were approximately 3,881,310 individuals (53% of the total within Newhall Land as a whole) occupying 2.3 acres within the preserve area. Of the spineflower observed in the preserve area in 2003, 315,017 spineflower (17%) are within the on-site utility easement. Of the spineflower observed in the preserve area in 2005, 217,632 spineflower (6%) are within the utility easement.

Ecological Indicators (Vegetation, Soils, Geology, Slope, Aspect, Elevation)

Agricultural land, California sagebrush scrub, and chaparral are the primary habitats within the Grapevine Mesa Preserve Area. The preserve also includes smaller components of California annual grassland, alluvial scrub, coast live oak woodland, disturbed land, and Great Basin scrub. There are approximately 12.2 acres of California sagebrush scrub, with between 10% and 30% cover of bare ground. Although California sagebrush scrub is the primary habitat for spineflower within the Grapevine Mesa Preserve Area, limited spineflower occurrences are located within disturbed land, alluvial scrub, California annual grassland, Great Basin scrub, chaparral, and coast live oak woodland. Other vegetation communities and land covers within the Grapevine Mesa Preserve Area include agricultural land. Acreages of vegetation communities and recorded individual spineflower occurrences within the Grapevine Mesa Preserve Area are listed in *Table 15* for 2003 and 2005. Total numbers of spineflower were greater in 2005 than in 2003, especially in the California sagebrush scrub, coast live oak woodland, California annual

grassland, and alluvial scrub community types. Fewer spineflower were observed in the Great Basin scrub and chaparral communities in 2005 than in 2003. The agricultural land and disturbed land will be restored as described below, in accordance with *Section 10.3*.

Table 15
Vegetation Communities and Land Covers within the Grapevine Mesa Preserve Area 2003 and 2005

Vegetation Type	Acres	Individuals 2003	Individuals 2005	% Change
Alluvial scrub	1.62	30,940	100,080	223.5%
California annual grassland	6.86	241,834	675,206	179.2%
Chaparral	7.20	56,251	16,444	-70.8%
California sagebrush scrub	12.22	1,490,980	3,069,744	105.9%
Great Basin scrub	0.96	10,911	1,186	-89.1%
Coast live oak woodland	1.84	2,169	18,649	759.8%
Agricultural land	11.65	0	1	Minimal
Disturbed land	1.73	1	0	Minimal
TOTAL	**44.08**	**1,833,086**	**3,881,310**	**111.7%**

The Grapevine Mesa Preserve Area soils consist mostly of Zamora loam (2% to 9% slopes) and terrace escarpments but also include severely eroded Castaic and Saugus soils (30% to 65% slopes). The majority of the preserve area consists of Plio-Pleistocene non-marine, Pliocene non-marine deposits. There are less than 2 acres of alluvium (mostly Holocene, some Pleistocene) Quaternary non-marine and marine deposits within the preserve area.

Slopes within the preserve area are gentle to moderate, with more than 90% of the preserve area occurring on slopes less than 20°. More than 80% of the slopes in the preserve area are west-, southwest- or northwest-facing. Elevations range from 1,000 to 1,320 feet AMSL, with a relatively even distribution of elevations occurring throughout the preserve area.

Adjacent Land Uses

Existing land uses adjacent to the Grapevine Mesa Preserve Area are limited to ongoing agricultural activities located on Grapevine Mesa within and above the preserve area. Open space within the Santa Clara River corridor is located to the north of the preserve area, and additional undeveloped land occurs to the south and west.

Adjacent to the northern portion of the Grapevine Mesa Preserve Area, planned land uses include medium-density residential uses to the northeast of the preserve area, low- to medium-density residential uses and existing undeveloped land to the northwest, and open space along the Santa Clara River corridor to the north (*Figure 20*). In the southern portion of the Grapevine Mesa

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Grapevine Mesa Preserve Area with Adjacent Land Use

FIGURE 20

Preserve Area, planned adjacent land uses include commercial development to the east and west of the preserve area and high-density residential uses to the south of the preserve area.

Buffer Areas within Grapevine Mesa Preserve Area

Where the Grapevine Mesa Preserve Area is adjacent to development, spineflower occurrences would generally be separated from development by 80 to 200 feet or more. Where the Grapevine Mesa Preserve Area is adjacent to open space in the northwest, the preserve is upslope, and the distance between the nearest spineflower occurrence and the preserve boundary varies from 80 to approximately 200 feet. On the east side of the preserve, the distances between spineflower occurrences and the preserve boundary (and adjacent development) vary from 105 feet to over 200 feet. On the west side of the preserve, the distances between spineflower occurrence and the preserve boundary (and adjacent development) vary from 80 to 170 feet. Management measures described in *Section 9.0*, in combination with these buffer widths, are intended to address various risk factors from adjacent changes in land use and contribute to a primary goal of this plan, which is to provide for the long-term persistence of spineflower within the project study area.

Pollinators Present

Flies, beetles, and ants were the dominant visitors to spineflower populations at Grapevine Mesa during the mid-season survey (April 23-25, 2004). The number of visits during the mid-season survey was 2,021. Flies and beetles were the dominant spineflower visitors during the late-season survey (May 7-9, 2004). The number of visits during the late-season survey was 1,483. However, insect visitors to spineflower populations were very diverse at all three survey locations (Airport Mesa, Grapevine Mesa, and Entrada) and reflected the relative abundance of insects in the community (Jones et al. 2004). Seven orders of insects were observed visiting spineflower populations, including Hymenoptera (bees and ants), Coleoptera (beetles), Homoptera (cicadas), Diptera (flies), Hemiptera (true bugs), Mantodea (mantids), and Lepidoptera (moths). The California sagebrush scrub, chaparral, Great Basin scrub, alluvial scrub, coast live oak woodland, and California annual grassland within the preserve may continue to provide habitat for the above-described insects, especially flies and beetles.

8.3 San Martinez Grande Preserve Area

The San Martinez Grande Preserve Area encompasses 34.4 acres dominated by California sagebrush scrub and California annual grassland communities on slopes below the primary north-/south-trending ridgeline on the west side of San Martinez Grande Canyon (*Figure 16*). This preserve area will conserve one of the two known occurrences of spineflower at Newhall Land that are located north of the Santa Clara River.

Occurrence Data

Occurrence data are provided in *Table 16*. This preserve would conserve 100% of the spineflower observed there in 2003, accounting for approximately 19% of all spineflower observed at Newhall Land that year. Approximately 95% of the preserve area burned in fall 2003, a year in which approximately 1,124,388 individuals were observed on 2.1 acres. In 2005, approximately 123,531 spineflower were observed on 1.4 acres, accounting for 1.7% of all spineflower observed at Newhall Land that year. The San Martinez Grande Preserve Area saw a decrease of approximately 1 million spineflower individuals between 2003 and 2005.

Table 16
Vegetation Communities and Land Covers within the San Martinez Grande Preserve Area (2003 and 2005)

Vegetation Type	Acres	Individuals 2003	Individuals 2005	% Change
California annual grassland	14.80	153,955	5,265	-96.6%
California sagebrush scrub	19.47	970,420	118,266	-87.8%
Elderberry scrub	0.16	0	0	0
TOTAL	**34.43**	**1,124,375**	**123,531**	**-89.0%**

Ecological Indicators (Vegetation, Soils, Geology, Slope, Aspect, Elevation)

Prior to burning in the fall of 2003, vegetation consisted mostly of California annual grassland and California sagebrush scrub. Although approximately 95% of the preserve area burned, the area was observed to be quickly re-vegetating in the spring of 2004 with filaree (*Erodium* spp.), giant ryegrass (*Leymus condensatus*), and slender mariposa lily (*Calochortus clavatus* var. *gracilis*). Acreages of vegetation communities and observed individual spineflowers in 2003 and 2005 within the San Martinez Grande Preserve Area are listed in *Table 16*.

The San Martinez Grande Preserve Area soils are almost entirely Castaic-Balcom silty clay loams (30% to 50% slopes, eroded). Yolo loam (2% to 9% slopes), Hanford sandy loam (2% to 9% slopes), and Castaic-Balcom silty clay loams (50% to 60% slopes, eroded) also occur but make up less than 5% of this preserve area. Geology within the preserve area is limited to Pliocene marine deposits. A portion of the occupied habitat area is located on landslide debris.

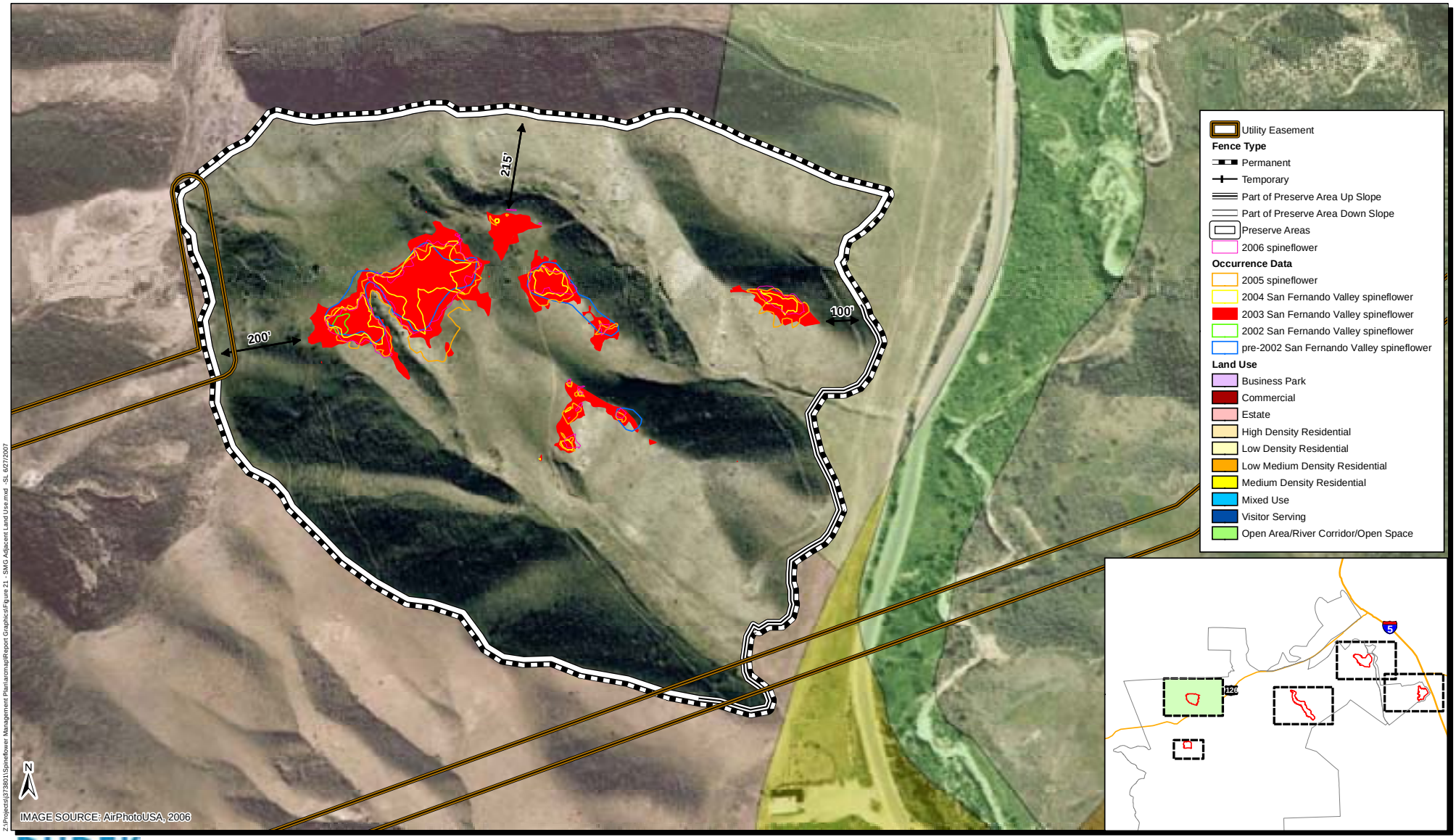
Slopes within the preserve area are moderate to steep, with approximately 68% of the preserve area occurring on slopes between 10° and 30°. Approximately 94% of the spineflower in the preserve occurs on slopes ranging from 15° to 25° and 97% occurs on slopes ranging from 10° to 30°. As the San Martinez Grande Preserve Area occurs on the east-facing side of a north-/south-trending ridgeline, the majority of slopes within the preserve have a southeastern or eastern aspect. Elevations range from 920 to 1,360 feet AMSL, with the majority of the preserve area occurring between elevations of 960 and 1,120 feet AMSL.

Adjacent Land Uses

Historically, areas in the vicinity of the San Martinez Grande Preserve Area have been used for agriculture and grazing. Currently, a single-family residence and a barn used for hay storage are located to the south of the preserve area on the west side of San Martinez Grande Canyon Road. The Santa Clara River and State Route 126 are located to the south of the San Martinez Grande Preserve Area, and San Martinez Grande Canyon Road is located to the east. Undeveloped areas occur to the north and west of the preserve area.

Buffer Areas within San Martinez Grande Preserve Area

The preserve area will be surrounded on all sides by estate and low-density residential development; the buffer varies from 100 feet to more than 600 feet. Open space is located approximately 100 feet to the east but not immediately next to the preserve (*Figure 21*). Where the preserve is downslope of adjacent land uses, the minimum distance between spineflower occurrences and the preserve boundary is 200 feet, with a maximum buffer of approximately 600 feet. Where the preserve is upslope of adjacent land uses (the east side of the preserve), the minimum distance between spineflower occurrences and the preserve boundary is 100 feet, with a maximum buffer of over 600 feet. Management measures described in *Section 9.0*, in combination with these buffer widths, are intended to address various risk factors from changes in adjacent land use and contribute to a primary goal of this plan, which is to provide for the long-term persistence of spineflower within the project study.



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San Martinez Grande Preserve Area with Adjacent Land Use

FIGURE 21

8.4 Potrero Preserve Area

The Potrero Preserve Area is located at the mouth of Potrero Canyon in the southwestern portion of the NRSP (*Figure 17*) and contains the westernmost population of spineflower within the Newhall Land property holdings in the project study area. The preserve area is 14.8 acres, dominated by California sagebrush scrub and California annual grassland and is located on the west side of Potrero Canyon near Windy Gap.

Occurrence Data

Occurrence data are provided in *Table 17*. Within Newhall Land as a whole, the Potrero Preserve Area accounted for 4% (222,513 individuals on 1.2 acres) of spineflower observed in 2003 and 3% (243,631 individuals on 0.7 acres) of spineflower observed in 2005. As shown in *Table 17,* an increase of 9.5% was observed in spineflower populations between 2003 and 2005.

Table 17
Vegetation Communities and Land Covers within the Potrero Preserve Area
2003 and 2005

Vegetation Types	Acres	Individuals 2003	Individuals 2005	% Change
California annual grassland	3.02	55	58	5.5%
California sagebrush scrub	8.20	151,803	142,124	-6.4%
California sagebrush scrub (disturbed)	3.38	70,655	101,449	43.6%
Disturbed land	0.16	0	0	0.0%
TOTAL	**14.76**	**222,513**	**243,631**	**9.5%**

Ecological Indicators (Vegetation, Soils, Geology, Slope, Aspect, Elevation)

California sagebrush scrub, disturbed California sagebrush scrub, and California annual grassland are the primary vegetation communities within the Potrero Preserve Area. Disturbed California sagebrush scrub occurs when the primary constituents of a California sagebrush scrub community are present, but the overall cover of non-native vegetation exceeds 20%. The predominance of non-native species within California sagebrush scrub in the preserve area is likely a combination of disturbance from past grazing activities and proximity to ongoing agricultural activities in adjacent areas. Spineflower occurrences within the Potrero Preserve Area are located within disturbed and undisturbed California sagebrush scrub and California annual grassland. Within the preserve area, spineflower has not been observed within disturbed

land areas. Acreages of vegetation communities and land covers within the Potrero Preserve Area are listed in *Table 17*. The disturbed land and disturbed California sagebrush scrub will be restored as described below, in accordance with *Section 10.3*.

The Potrero Preserve Area soils are predominantly Castaic-Balcom silty clay loams (20% to 50% slopes, eroded). Terrace escarpments and Yolo loam (2% to 9% slopes) also occur within this preserve but account for only 14% and 2% of the preserve area, respectively. Geology within the Potrero Preserve Area is roughly two-thirds alluvium (mostly Holocene, some Pleistocene) Quaternary non-marine and marine and one-third Pliocene marine.

The majority of slopes in the Potrero Preserve Area are gentle to moderate, with approximately 79% of the slopes having an incline of less than 20°. Slopes in this preserve area are predominantly southeast-, east-, and south-facing. Elevations range from 820 to 1,080 feet AMSL, with the majority of the preserve area occurring between 1,000 and 1,080 feet AMSL.

Adjacent Land Uses

Current land uses within Potrero Canyon include ongoing agricultural and ranching operations. Immediately adjacent to the preserve area are actively farmed fields. Open space along the Santa Clara River corridor is located to the north of the preserve area, while additional undeveloped areas along the slopes and ridges of Potrero Canyon are in open space to the east of the preserve area.

Buffer Areas within Potrero Preserve Area

The Potrero Preserve Area is currently adjacent to open area on the north and east. To the south and west of the Potrero Preserve Area, planned land uses include low- and low-medium-density residential development; estate residential development would occur farther to the southwest (*Figure 22*). The Santa Clara River corridor and the mouth of Potrero Canyon would remain in open space to the north, while planned uses farther up the canyon include medium-density residential development and a community/neighborhood park. The preserve area is entirely upslope of adjacent lands, as shown in *Figure 22*. The minimum distance between the nearest spineflower occurrences and the preserve boundary is 80 feet, with a maximum buffer of 400 feet. However, the open space to the north and east extends several hundred feet beyond the preserve boundaries. Management measures described in *Section 9.0*, in combination with these buffer widths, are intended to address various risk factors from changes in adjacent land use and

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Potrero Preserve Area with Adjacent Land Use

FIGURE 22

contribute to a primary goal of this plan, which is to provide for the long-term persistence of spineflower within the project study.

8.5 Entrada Preserve Area

The Entrada Preserve Area includes the easternmost occurrence of spineflower on Newhall Land property holdings within the project study area (*Figure 18*). This preserve area encompasses 26.6 acres located in the southeastern corner of the Entrada planning area. The Old Road and Interstate 5 are located to the east of the preserve area, and the existing Westridge golf course is located to the south of the preserve area.

Occurrence Data

Occurrence data are provided in *Table 18*. Within Newhall Land as a whole, the Entrada Preserve Area accounted for 12% (735,580 individuals on 0.8 acres) of the spineflower observed in 2003 and 4% (301,653 individuals on 0.7 acres) of spineflower observed in 2005. An overall decline of about 60% in spineflower individuals was observed between 2003 and 2005, although there was a considerable increase in spineflower individuals observed in disturbed areas in that time period (see *Table 18*). Of the spineflower observed in the preserve area in 2003, 160,063 (22%) lie within the utility easement. Of the spineflower observed in the preserve area in 2005, 28,275 (9%) lie within the utility easement.

Ecological Indicators (Vegetation, Soils, Geology, Slope, Aspect, Elevation)

The Entrada Preserve Area consists of approximately 23.4 acres of California annual grassland, while California sagebrush scrub (including disturbed California sagebrush scrub) and disturbed land make up roughly equal portions of the remaining 3 acres. Disturbed California sagebrush scrub was mapped where the primary constituents of a California sagebrush scrub community are present but where the overall cover of non-native vegetation exceeds 20%. The predominance of non-native species within California sagebrush scrub in the preserve area is likely a combination of disturbance from past grazing activities and ongoing physical disturbances in adjacent areas (e.g., maintenance of access roads). Acreages of vegetation communities and land covers within the Entrada Preserve Area are listed in *Table 18*. Approximately 5 acres within the preserve lie within an existing utility easement. The developed land and disturbed land will be restored, as described in accordance with *Section 10.3*.

Table 18
Vegetation Communities and Land Covers within the Entrada Preserve Area
2003 and 2005

Vegetation Types	Acres	Individuals 2003	Individuals 2005	%Change
California annual grassland	23.43	667,409	246,750	-63.0%
California sagebrush scrub	0.22	0	0	0.0%
California sagebrush scrub (disturbed)	1.40	68,171	53,167	-22.0%
Developed	0.18	0	0	0.0%
Disturbed land	1.32	0	1,736	Increase
TOTAL	**26.55**	**735,580**	**301,653**	**-59.0%**

The Entrada Preserve Area soils are predominantly Saugus loam (30% to 50% slopes). Approximately 5% of the preserve consists of Hanford sandy loam (2% to 9% slopes), Metz loam (2% to 5% slopes), and Yolo loam (0% to 2% slopes). Geology within the preserve area includes alluvium (mostly Holocene, some Pleistocene) Quaternary non-marine and marine.

Slopes are gentle to moderate, with none of the preserve occurring on slopes greater than 15°. More than half of the preserve area includes northeast- and east-facing slopes, with flat areas and north-facing slopes accounting for approximately one-third of the preserve area. Elevations range from 1,080 to 1,240 feet AMSL, with the majority of the preserve area occurring between 1,160 and 1,200 feet AMSL.

Adjacent Land Uses

Existing land uses adjacent to the Entrada Preserve Area include a golf course to the south of the preserve area, the Old Road and I-5 to the east, undeveloped land to the west, and the Six Flags Magic Mountain Amusement Park to the north. In addition, Southern California Edison and Southern California Gas Company transmission lines run along the southeastern boundary inside of the proposed preserve area and include actively maintained dirt roads through the preserve area.

Buffer Areas within Entrada Preserve Area

Planned land uses adjacent to the Entrada Preserve Area include residential uses to the west and open space to the north and southwest. Areas immediately to the south of the preserve area would remain as existing golf course, while the planned westward extension of Magic Mountain Parkway would be located several hundred feet to the north of the preserve area (*Figure 23*).

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Entrada Preserve Area with Adjacent Land Use

FIGURE 23

The entire preserve area is located downslope of adjacent lands. Where adjacent to the proposed residential development, the buffer varies from 80 to 100 feet. Where adjacent to open space, the minimum buffer is 80 feet. Where adjacent to the existing golf course, the minimum distance between spineflower occurrences and the adjacent land use is 80 feet. Management measures described in *Section 9.0*, in combination with these buffer widths, are intended to address various risk factors from changes in adjacent land use and contribute to a primary goal of this plan, which is to provide for the long-term persistence of spineflower within the project study area.

Pollinators Present

In contrast to spineflower visitors observed at Airport Mesa and Grapevine Mesa, ants and beetles (rather than flies and beetles) were the dominant visitors to spineflower populations at the Entrada planning area during the mid-season survey (April 23-25, 2004). There were 2,488 visits during the mid-season survey. During the late-season survey (May 7-9, 2004), ants were more dominant among spineflower visitors, while bees, beetles, and flies occurred with relatively similar frequency among spineflower visitors during the late season. There were 1,009 visits during the late-season survey. However, insect visitors to spineflower populations were very diverse at all three survey locations (Airport Mesa, Grapevine Mesa, and Entrada) and reflected the relative abundance of insects in the community (Jones et al. 2004). Seven orders of insects were observed visiting spineflower populations, including Hymenoptera (bees and ants), Coleoptera (beetles), Homoptera (cicadas), Diptera (flies), Hemiptera (true bugs), Mantodea (mantids), and Lepidoptera (moths). The California sagebrush scrub and California annual grassland within the preserve may continue to provide habitat for the above-described insects, especially ants and beetles.

9.0 MANAGEMENT ACTIVITIES

The primary goal of the management activities outlined herein is to help ensure the long-term survival of spineflower and the preservation of existing native habitats, biodiversity, and corresponding biological functions and values. This goal will be achieved in part by implementing the measures listed in *Sections 9.1* to *9.3*, all of which are based on the adopted NRSP EIR mitigation measures (County of Los Angeles 2003). *Section 9.1* identifies general management measures that are to be implemented for spineflower populations adjacent to agricultural areas and during project development and construction activities. *Section 9.2*

describes general long-term management measures for permanent spineflower preserve areas, and *Section 9.3* describes specific management measures for each preserve.

A preserve manager will be contracted with and paid for by Newhall to perform environmental monitoring, oversee the spineflower preserve areas, and ensure the monitoring and management activities outlined herein are carried out. The preserve manager will be a qualified botanist or land management entity/biological firm with qualified botanists on staff, approved by the County and CDFG (in accordance with NRSP EIR [County of Los Angeles 2003] Mitigation Measures 4.6-66 and 4.6-77). For the purposes of this report, a qualified botanist shall have a bachelor's degree or higher in biology, botany, or a similar field; be intimately familiar with spineflower ecology, local plant communities, invasive plant and animal control methods, and biological data collection and assessment; and have verifiable experience performing similar types of environmental monitoring, reporting, and natural lands management. The preserve manager will be responsible for submitting the reports indicated herein and will have the authority to stop work when such work is damaging or would damage spineflower, its habitat, buffer connectivity, or open space areas.

9.1 General Management Measures

9.1.1 Management Measures for Existing Agricultural Areas

Agriculture is defined for purposes of this Plan as the practice of cultivating the soil, producing irrigated and non-irrigated crops, and raising livestock. Grazing has occurred and/or is occurring within the project study area. Spineflower populations located adjacent to and within existing agricultural areas will be protected and preserved as outlined in this section to help ensure a successful coexistence of agricultural activities and spineflower populations. *Figures 14* through *18* show where spineflower populations occur within and adjacent to agricultural areas. Potential threats to spineflower from adjacent agricultural activities include physical intrusion (i.e., damage by equipment and agricultural personnel), introduction of opportunistic pest plants (weeds), insect pests, irrigation runoff, fertilizer runoff, pesticide runoff or drift, farm animal grazing, trash accumulation, and artificially accelerated erosion processes. A decline in pollinators due to poorly performed insecticide spraying or trapping is possible, although there is limited data available to substantiate such effects at this time. Agricultural activities within the VCC planning area are expected to cease at the time of project construction, which is expected to occur within 10 years, while agricultural activities within the NRSP and the Entrada area are expected to cease at the time of full build-out, which is expected to occur within 25 years. Regular and ongoing consultation will be maintained with the County and CDFG in connection

with ongoing agricultural operations in order to avoid or minimize significant direct impacts to the spineflower. Additionally, 30 days advance written notice shall be provided to the County and CDFG of the proposed conversion of its ongoing rangeland operations on Newhall Ranch to more intensive agricultural uses.

Signage

Outdoor all-weather signs measuring approximately 12 inches by 16 inches will be posted at approximately 400 feet on center, except adjacent to road crossings, where signs will be posted 200 feet on center. Signs will be placed where topographic features allow the sign to be seen at a distance (not the verbiage itself). Signs will state in English and Spanish that the area is a biological preserve that hosts a state-listed endangered and federal candidate plant species and that entry is not allowed without written permission from the preserve manager. Signs will indicate that persons responsible for damage to the protected species will be subject to prosecution, including fines and/or imprisonment. Signage shall include contact information and indicate that pesticide spraying is not allowed outside of agricultural areas. Signs will be placed along the boundaries of the two existing conservation easements by December 2007.

Erosion Control

Spineflower populations adjacent to or downstream of agricultural operations will be protected from agriculture-related runoff, erosion, and sedimentation by various measures. Fabric silt fencing may be used where runoff and sediment could potentially enter into adjacent spineflower populations, as determined by the preserve manager. Since soil will be moved, tilled, disked, plowed, and amended in agricultural fields, the goal of erosion control in agricultural areas is to keep loose soil within the confines of the agricultural areas and prevent it from entering into spineflower habitat. Silt fencing, burlap sand/gravel bags, weed seed–free straw wattles, and other temporary best management practices (BMPs) will be deployed and maintained to ensure soil is kept within agricultural areas. The BMPs will be monitored by the preserve manager prior to and following rainfall events, and the manager will indicate when BMP maintenance and sediment removal are necessary. Silt fencing and other temporary BMPs will not be placed within sandy washes and riparian areas subject to seasonal stream flows and flooding, as placing these structures in such areas would only add debris to the floodplain area.

Fabric silt fencing will be 18 inches wide and installed pursuant to the standard detail of the California Department of Transportation (Caltrans). Other erosion control measures and devices

will be deployed as deemed necessary by the preserve manager, in consultation with Newhall and CDFG.

Agricultural Management Practices

Agricultural management practices include those that avoid and minimize over-watering, over-fertilization, and fertilizer runoff and that avoid damage to the spineflower within and immediately adjacent to spineflower preserve areas. This will be accomplished in part by ensuring all agricultural managers are informed about adjacent sensitive resources (spineflower) and that their personnel are informed in order to avoid unintentional impacts to spineflower.

Newhall will produce a list of agricultural managers working within and adjacent to spineflower preserve areas indicating for which area each agricultural manager is responsible and the name and phone number of the company for whom they work (if other than Newhall). If the preserve manager finds that an agricultural area within or adjacent to a spineflower preserve is not being managed as outlined herein, the preserve manager will be required to immediately notify Newhall and the CDFG.

Agricultural practices within and adjacent to preserve areas will utilize Integrated Pest Management (IPM) techniques to control pests. The agricultural managers will be responsible for ensuring the techniques, requirements, and restrictions outlined herein are followed for their particular agricultural areas within or adjacent to spineflower preserve areas.

Prescriptions for fertilizing will be carefully calculated to prevent over-fertilization and nutrient-rich (fertilizer-laden) runoff, which could negatively affect spineflower habitat, decrease water quality, and exacerbate weeds. Fertilizer calculation sheets will be filled out for each fertilizer application for each irrigated and non-irrigated row crop field in the Grapevine Mesa and Airport Mesa preserve areas (active agriculture areas) and will be subject to review by the preserve manager. Fertilizer calculation sheets will be cataloged, and copies will be maintained by the preserve manager. Application of fertilizer shall avoid applying fertilizer into the spineflower preserve areas.

As required by law, all pesticide applications will be supervised by a person who possesses a valid qualified pesticide applicators license. A pest control advisor (PCA) will make written recommendations when required by law and by the Department of Pesticide Regulations. All pesticides will be applied in accordance with their labeled directions as required by law. Under applicable law, pesticides cannot be applied when there is the potential for drift onto non-target

crops/areas. Under no circumstances will pesticides be applied where spineflower or native vegetation within preserve areas would be damaged.

The preserve manager shall be notified by the agricultural managers prior to the application of pesticides when the application is within 250 feet of a spineflower population. The preserve manager will review preserve areas prior to and following pesticide application. If non-agricultural vegetation communities or spineflower appear to be affected by the pesticide application, the preserve manager shall notify the CDFG and Newhall, and the agricultural manager will be required to implement measures to ensure that pesticides are not applied where it would cause damage to spineflower within preserve areas.

The implementation of signage and erosion-control devices, along with responsible and professional agricultural management and practices, including IPM techniques, properly trained and informed agricultural management and field personnel, and seasonal (quarterly, or more frequently when fertilizers and pesticide applications may occur) monitoring by the preserve manager, will ensure that spineflower populations are not adversely affected by ongoing agricultural activities.

9.1.2 Management Measures during Construction

Construction Plans and Specifications

Construction plans and specifications (construction documents) for development areas that are adjacent to or contain spineflower populations shall clearly identify spineflower population location(s) on the plans and call them out as environmentally sensitive areas to be avoided. The only exception shall be those populations permitted for take that will not be conserved. The plans will include temporary and permanent preserve fencing and signage as indicated in *Sections 9.2.5 and 9.2.6*. Preserve fencing shall be shown on the plans and installed prior to initiating construction clearing and grubbing activities. The preserve manager will monitor fence installation. Clearing for fence installation will be minimized, and weed management will be performed following fence installation to ensure cleared areas that were not weed dominated prior to fence installation do not become weed dominated after installation. Native perennial seed and/or plugs will be planted along any areas on the preserve side of the fence disturbed by fence construction. Species selected will depend on adjacent native habitat types. The non-preserve side of the fence, including development areas, fire management zones (FMZ), and landscaped areas, will be planted and maintained in accordance with FMZ/landscape plans, which are subject to the review of the County Fire Department. Silt fence shall be installed at the edge of

development manufactured slopes when the spineflower preserve is downslope of proposed development.

Construction documents shall indicate that the general contractor is responsible for protecting spineflower during construction work. The construction documents will indicate that the contractor is responsible for informing all employees and subcontractors of the environmentally sensitive areas and the proper conduct of work when working near (e.g., within 100 feet) of these areas. The construction documents will require a pre-construction meeting to perform an "environmental education session" with the general contractor/contractor's employees, subcontractors, and equipment operators prior to commencing construction work. The environmental education session will be conducted by the preserve manager and focus on informing workers of the location and sensitivity of the spineflower and the requirements to protect it. The construction documents will indicate that the general contractor shall be responsible for mitigating any impacts to spineflower due to the negligence of the general contractor/contractor's employees, subcontractors, or equipment operators. If accidental take occurs during construction, the general mitigation measures shall be addressed, in accordance with the Section 2081 permit (California Fish and Game Code, Section 2081) issued by CDFG under CESA.

Construction plans will include water-control plans, erosion-control plans, dust-control plans, specifications, and details, along with an overall project stormwater pollution prevention plan (SWPPP). Together, these documents will include measures to ensure that spineflower populations are protected during construction. The preserve manager will review these documents prior to finalization to ensure they do not contain items that could inadvertently harm spineflower, such as planting or seeding invasive species in development areas within 200 feet of preserve areas or using erosion-control devices that may contain weeds, such as hay bales.

Construction plans shall include the following measures/restrictions to avoid impacting spineflower during construction:

(1) Do not windrow or stockpile soil along spineflower preserve boundaries;
(2) Do not locate staging areas, maintenance areas, or concrete washout areas adjacent to or upstream of preserves; and
(3) Do not store toxic compounds, including fuel, oil, lubricants, paint release agents, or any other construction materials that could damage spineflower if spilled near spineflower areas, upstream of preserves, or along preserve boundaries.

Development-related construction plans and specifications shall be reviewed by the preserve manager at 50%, 70%, and 100% (signed final set) design for compliance with this Plan and associated permits and project-related environmental documents.

Construction Fencing

Areas adjacent to the spineflower preserves that will not receive permanent fencing, such as those areas adjacent to dense native habitat, shall be protected prior to clearing and during construction with temporary construction fencing. The fencing shall be installed, reviewed, and approved by the preserve manager prior to initiating clearing work. The areas behind the temporary fencing shall not be used for the storage of any equipment, materials, construction debris or anything associated with construction activities.

The fencing shall be three-strand non-barbed wire fence or bright orange U.V.-stabilized polyethylene construction "snow" fencing, attached to metal t-posts that extend at least 4 feet above grade. Openings shall be included in the fence when located within wildlife corridors and habitat connectivity areas to allow for the safe passage of wildlife. The preserve manager shall indicate the location and width of each of these openings. Protective fencing shall be maintained in good condition until completion of project construction. The preserve manager will review fencing monthly during construction monitoring visits and note any fencing that is in need of repair. Repairs shall be completed within 2 days of notification by the preserve manager.

Dust Control

Development areas shall have dust-control measures implemented and maintained to prevent dust from impacting vegetation within the spineflower preserve areas. Dust-control plans shall be prepared prior to initiation of construction activities and comply with Rule 403 (South Coast Air Quality Management District 1976 [amended 2005]). Where construction activities occur within 100 feet of a spineflower location, chemical dust suppression shall not be utilized. A screening fence (i.e., a 6-foot-high chain link fence with green fabric up to a height of 5 feet) will be installed to protect spineflower locations where determined necessary by the preserve manager.

Erosion Control

Development areas shall have erosion-control measures implemented and maintained to prevent erosion and sedimentation from occurring or entering into spineflower preserve areas. Fabric silt

fencing will be installed per the standard Caltrans' detail (Caltrans 1997, updated 2006) at the base of slopes and anywhere runoff or sediment could potentially enter into spineflower preserves, as determined by the preserve manager. Graded slope areas will be trimmed and finished as grading proceeds, as well as being treated with soil stabilization measures to minimize erosion. Such measures may include seeding and planting, mulching, use of geotextiles, and use of stabilization mats. Site development construction documents will include erosion-control plans and a project SWPPP. Project-specific BMPs will be submitted to the County for review prior to construction (NRSP EIR Mitigation Measures 4.6-73 and 4.6-75 [County of Los Angeles 2003]).

Water Control

Development areas shall have water-control measures implemented and maintained to minimize changes in surface water flows to the spineflower preserve areas. Watering of graded areas will be controlled to prevent discharge of construction water into the spineflower preserve areas and on ground sloping toward the preserve areas. Diversion ditches will be constructed to redirect storm water flows from graded areas away from the spineflower preserve areas. To the extent practicable, grading of areas adjacent to the preserves will be limited to spring and summer months (May through September), when the probability of rainfall is lower. Final grading and drainage design will be developed that does not change the current surface and subsurface hydrological conditions within the spineflower preserve areas. Both irrigation plans and a storm water flow redirection plan will be prepared and submitted for approval to the County prior to the initiation of grading operations,

Construction Monitoring and Reporting

The preserve manager shall perform weekly construction monitoring for all construction adjacent to preserve areas. The preserve manager's construction monitoring tasks will include reviewing and approving protective fencing, dust-control measures and erosion-control devices before construction work begins, conducting a contractor education session at the preconstruction meeting, and reviewing the site weekly (minimum) during construction to ensure the fencing, dust control, and BMP measures are in place and functioning correctly and that work is not directly or indirectly impacting spineflower plants. Each site visit will be followed up with a summary monitoring report faxed to Newhall indicating the status of the site. A monitoring report will also be submitted to the County each month. Monitoring reports will include remedial recommendations when necessary.

9.2 General Management Measures for Preserve Areas

9.2.1 Easements

Each preserve will be placed into a permanent conservation easement to ensure long-term protection. The permanent conservation easement will contain appropriate restrictions that will help ensure the property remains in a natural condition in perpetuity. The conservation easement language will establish specific protections for the spineflower and preserve areas. The CDFG will review and approve the easement language before recordation.

9.2.2 Management Entities

The spineflower preserves will be managed by Newhall and its preserve manager and/or the natural lands management organization(s) (NLMO). Newhall will submit a statement of qualifications for the proposed preserve manager(s)/NLMO(s) for approval by the County and CDFG.

9.2.3 Landscape Planting Adjacent to Preserves

All plants and seeding proposed for use on landscaped slopes, street medians, park sites, and other landscaped and fuel modification areas will be reviewed and approved by the preserve manager to ensure the proposed landscape plants will not naturalize and cause maintenance or habitat degradation in the preserve and buffer areas. Container plants to be installed within 200 feet of the preserves shall be inspected by the preserve manager for the presence of disease, weeds, and pests, including Argentine ants. Plants with pests, weeds, or diseases shall be rejected. In addition, landscaping throughout the Specific Plan area shall not include species found on the Cal-IPC list of *Exotic Pest Plants of Greatest Ecological Concern in California* (most recent version) or on the list of Invasive Ornamental Plants listed in *Appendix B*. The current Cal-IPC list can be obtained from Cal-IPC or online at http://www.groups.ucanr.org/ceppc/ Pest%5FPlant%5FList/. See *Appendix C* for a discussion of Argentine ants, associated threats, preserve design, and mitigation and management measures.

9.2.4 Access

In order to help ensure the preservation of the spineflower, as well as the other native plant communities and wildlife, all portions of the preserves will be closed, with the exception of pre-identified existing dirt roads and utility easements. The pre-identified existing dirt roads and

utility easement access roads will function as access for the preserve manager, preserve maintenance personnel, utility personnel, and emergency services vehicles (e.g., police, fire, and medical) and will be designated foot-traffic-only on nature trails. The dirt roads will be gated and locked at the outside edges of the buffer zone. Paths proposed for use as nature trails will have openings in the fencing at identified trailhead locations wide enough only for foot traffic to pass through. Signs will be posted as outlined herein. The only persons or entities issued gate keys will be the preserve manager and the manager's employees, easement-holding utility companies, emergency services, and CDFG.

9.2.5 Fencing

Preserve areas located adjacent to proposed developments, parks, golf courses, or other "active land uses" will be fenced off with permanent fencing to prevent vehicular access and significantly deter unauthorized foot, mountain bike, all-terrain vehicle (ATV), and motorcycle access. Specific areas that are adequately protected by steep terrain (1.5:1 or steeper) and/or dense vegetation may not require fencing but would require signage. The determination of the need for fencing in these areas will be subject to the approval of the County and CDFG. If monitoring determines that slope and/or vegetation is not effective at deterring unauthorized access, the preserve manager or CDFG may require that additional fencing be installed.

Fencing will be installed along the outside edge of the preserve when adjacent to proposed developments and associated active land uses (in accordance with NRSP EIR Mitigation Measure 4.6-68 [County of Los Angeles 2003]). In general, this means that fencing will be installed between the preserve perimeter and the FMZs, which will prevent crews maintaining the FMZ areas from entering into the preserves. Fencing must extend a minimum of 4 feet above grade and be capable of preventing unauthorized vehicular access. Fencing shall deter unauthorized foot, mountain bike, ATV, and motorcycle access. Fencing, including wood-doweled split rail fencing, exterior-grade heavy-duty vinyl three-railed fencing, three-strand non-barbed wire, or similar fencing, installed adjacent to native habitat and natural open space areas will allow for the passage of animals. Fencing is not required in areas bordered by large parcels of dense native vegetation (subject to monitoring by the parcel manager and/or CDFG), conserved natural open space areas, or the Santa Clara River riparian corridor, as installing fencing in these areas would be unnecessary and damaging to existing vegetation and wildlife corridors.

9.2.6 Signage

Outdoor all-weather signs measuring approximately 12 by 16 inches will be posted on all access gates and along preserve fencing at approximately 400 feet on center, except adjacent to road crossings, where signs will be posted 200 feet on center. The placement will take topography into account, emphasizing placement on ridgelines, where they will be visible to emergency fire personnel and others. Signs will state in English and Spanish that the area is a biological preserve that hosts a state-listed endangered and federal candidate plant species and that trespassing is prohibited (in accordance with NRSP EIR Mitigation Measure 4.6-68). Signs will indicate that trespassers and individuals violating posted regulations (e.g., illegal dumping) or who damage the protected species will be subject to prosecution, including fines and/or imprisonment. Signs shall indicate that fuel modification and management work is not allowed within the preserve or buffer areas. Signage at trailheads shall describe the preserve, its purpose, and the applicable rules of conduct within the preserve. The signage shall state that people not abiding by these rules or who damage the habitat or protected species will be subject to prosecution, including fines and/or imprisonment. All signage shall include emergency contact information.

9.2.7 Water Control

Project-specific design measures will be implemented in order to minimize changes in surface water flows to the spineflower preserve areas. Roadways will be constructed with slopes that convey water flows within the roadway easements and away from spineflower preserve areas. French drains will be installed along the edge of any roadways and fill slopes that drain toward the preserve areas. Underground utilities will not be located within or through the preserve areas. Drainage pipes installed within the preserve areas away from spineflower populations to convey surface or subsurface water away from the populations will be aligned to avoid the preserve areas to the maximum extent practicable. Fencing or other structural type barriers that will be installed to reduce intrusion of people or domestic animals into the preserve areas shall incorporate footing designs that minimize moisture collection.

Storm Drains

Storm drain outfalls from proposed development areas will only be installed within preserve areas where necessary to retain hydrologic conditions within the preserves, sustain existing riparian and wetland habitats, and/or allow for the restoration of currently disturbed areas to native riparian/alluvial habitat.

When located in a preserve area, storm drains must meet the following criteria:

(1) Storm drains must not impact spineflower either directly or indirectly, based upon specific evaluations and a determination by CDFG;
(2) Storm drains may only daylight at the bottom of slopes within preserve areas; and
(3) Under no circumstances shall storm drains daylight onto steeply sloped areas or other areas that would cause erosion.

Any surface water entering a preserve area from development areas is required to pass through BMP measures, in accordance with the requirements of the County and Regional Water Quality Control Board (RWQCB), which will be described in the SWPPP. Storm drain outlets must contain adequate energy dissipaters to prevent downstream erosion and stream channel down-cutting, in accordance with the County and RWQCB requirements.

In addition, storm drain outlets must be designed based on pre- and post-construction hydrologic studies (in accordance with NRSP EIR Mitigation Measure 4.6-69 [County of Los Angeles 2003]). Storm drains and BMP measures shall be designed by a qualified licensed civil engineer, with design reviews by the consulting biologists, the County, and CDFG. Long-term maintenance of storm drain BMPs will be the responsibility of a County Landscape Maintenance District or other entity responsible for BMP maintenance.

9.2.8 Fuel Modification

Limited fuel modification activities within the spineflower preserves will be restricted to selective thinning with hand tools to allow the maximum preservation of spineflower populations. No other fuel modification or clearance activities shall be allowed in the Newhall Ranch spineflower preserve areas. Controlled burning may be allowed in the future within the Newhall Ranch preserve areas and buffers, provided that it is based upon a burn plan approved by the County of Los Angeles Fire Department and CDFG. Annual maintenance of fuel modification zones, such as the removal of undesirable non-native plants and other activities that ensure the long-term survival of spineflower, will be the responsibility of the preserve manager. The Homeowner's Association (HOA) will be responsible for any fuel modification that occurs in designated fuel modification zones outside the preserves.

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9.3 Specific Management Activities for Each Preserve

9.3.1 Airport Mesa Preserve Management

The specific management strategy for the Airport Mesa Preserve focuses on repair and restoration of previously disturbed areas within the preserve, weed management, and management of annual grass cover and thatch buildup. Much of the preserve supports habitats with considerable annual grass cover. If thatch levels build up over time and/or annual grass density and cover exceed the spineflower's tolerances, which have yet to be clearly defined, this could pose a threat to spineflower occurrence. Future quantitative monitoring will be designed to help understand these tolerances. Low levels of shrub cover on previously grubbed and/or terraced slopes and farm fields also may adversely affect pollinator habitat requirements. Therefore, management will also include enhancement in these areas by planting appropriate native species and restoring damaged soils. Proximity to adjacent development also is a threat to the preserve and will create management challenges. To help reduce threats from the adjacent development, fencing, signage, access restrictions, easements, and other protections shall be implemented as outlined in *Sections 9.2.1* through *9.2.8*.

To the west of the preserve, relatively small manufactured slopes and an FMZ will lead up to GG Street, a mixed use/commercial development area and water quality control basin. Immediately west of GG Street and the development area (off site), there is a large contiguous open space that leads to the Santa Clara River corridor. There is a culvert proposed to run below GG Street that will allow drainage from the preserve to continue west, which will help convey runoff and retain the existing hydrologic conditions within and downstream of the preserve. The culvert under GG Street will be sized to accommodate project storm flows.

The southern, eastern, and northern boundaries of the preserve will be bordered by FMZs leading down from development areas, as shown in *Figure 19*. Some habitat upslope from the preserved spineflower populations will therefore be removed and modified by development. In addition to the management measures described above, the FMZs will be planted with native and drought-tolerant plant species that do not naturalize, as indicated in *Section 9.2.3*. These plants require only limited water, which, when combined with the brow ditches and swales, and the careful managing and monitoring of the irrigation system and program scheduling, will prevent irrigation runoff from entering into the preserves.

All plants and seeding proposed for use on manufactured slopes and other landscaped areas and FMZs adjacent to the preserve areas are required to be in conformance with *Section 9.2.3*.

Weeds within the preserve and preserve buffer zones will be monitored and managed as outlined in *Sections 10.2* and *10.3*.

The preserve will be maintained and monitored as outlined in *Sections 10.2, 10.3,* and *11.0*.

9.3.2 Grapevine Mesa Preserve Management

The specific management strategy for the Grapevine Mesa Preserve focuses on restoring the previously cultivated farm field on the mesa top, while managing weeds and annual grasses within the adjacent natural habitat areas. Some habitat upslope from the preserved spineflower populations will therefore be removed and modified by development. This may threaten the downslope habitats by altering runoff, sheet flow, and sedimentation. Fencing, signage, access restrictions, easements, and other preserve protections will be implemented as outlined in *Sections 9.2.1* through *9.2.7* to address impacts associated with development of the surrounding western, eastern, and southern boundaries, as shown in *Figure 20*.

The northern boundary is adjacent to the Santa Clara River and associated dense riparian vegetation that protects this area and precludes the need for fencing and signage at this location.

The eastern boundary will be adjacent to a development area and associated FMZ. To the southwest of the preserve, an open space band will separate the preserve from a proposed development area and associated FMZ. The area located south and west of the preserve contains sizeable portions of the preserve's existing watershed area and, therefore, storm drain outlets will be needed to daylight in the preserve canyon bottom area in order to sustain the current hydrology and vegetation in that location. This will be assessed by the civil engineers and qualified biologist/preserve manager as the development plans become more definitive and will require approval by CDFG through the permitting processes. Any proposed storm drains to be daylighted in the preserve shall be designed in conformance with *Section 9.2.7*. Beyond the northwestern boundaries of the preserve, slopes will lead down to open space area.

The existing dirt road located within the preserve will function as a preserve maintenance access road and may be incorporated into a pedestrian-only trail system. Signage will be installed along the trail, as indicated in *Section 9.2.6*. Proposed trail locations will be subject to the review and approval of the County and CDFG.

Agricultural areas within the preserve will be restored to California sagebrush scrub, and restoration plans will address suppression of the weed seed bank, repair of soil micro-organisms, sequestering of nutrients, and other methods to achieve the restoration goals.

Weeds in the preserve will be managed as outlined in *Sections 10.2, 10.3,* and *11.0.*

9.3.3 San Martinez Grande Preserve Management

The specific management strategy for the San Martinez Grande Preserve Area focuses on management of annual grass cover, density and thatch, and weed management. Extensive areas dominated by annual grasses may be a threat if thatch levels buildup, and bare areas are reduced in extent. The adjacent development area is a significant threat with respect to edge effects and successfully managing and protecting the preserve. Most of the preserve perimeter will be downslope of development (*Figure 21*). Fencing, signage, access restrictions, easements, and other preserve protections will be implemented as outlined in *Sections 9.2.1* through *9.2.7.*

This preserve is surrounded by estate and low-density development and FMZs. The area located north, south, and west of the preserve contains sizeable portions of the preserve's existing watershed area, and, therefore, storm drain outlets will be needed to daylight in the preserve canyon bottom area in order to sustain the current hydrology and vegetation in that location. This will be assessed by the civil engineers and qualified biologist/preserve manager as the development plans become more definitive and will require approval by CDFG through the permitting processes. Any proposed storm drains to be daylighted in the preserve shall be designed in conformance with *Section 9.2.7.*

Portions of the preserve currently have a significant amount of non-native forbs that will be monitored and managed as outlined in *Sections 10.2, 10.3,* and *11.0* to ensure that they do not increase in cover or density and that they do not displace existing spineflower populations.

The preserve will be closed to the public, and there are no existing or proposed paths suitable for nature trails thereon. The preserve will be maintained and monitored as outlined in *Section 10.0.*

9.3.4 Potrero Preserve Management

The specific management strategy for the Potrero Preserve focuses on restoring habitat damaged by past disking, performing weed management, and managing annual grass cover, density, and thatch. Development would occur along the western and southern boundaries, as shown on

Figure 22. Preserve boundaries located adjacent to proposed development areas will have fencing, signage, access restrictions, easements, and other protections outlined in *Sections 9.2.1* through *9.2.7*.

The preserve is surrounded by open space to the east and north. The entire preserve is located at elevations above the development area, so the existing hydrologic regime within the preserve should be unchanged, and runoff from the development area will not reach the preserve.

Fencing and signage are not anticipated to be necessary along the northern and eastern preserve boundaries, due to dense vegetation and steep elevations. Fencing and signage will be installed along the western and southern boundaries, as outlined in *Sections 9.2.5* and *9.2.6*. There are no public access trails proposed within this preserve. The existing dirt road will be retained to function as a preserve maintenance access road only.

Weeds in the preserve will be managed as outlined in *Sections 10.2, 10.3,* and *11.0*.

9.3.5 Entrada Preserve Management

The specific management strategy for the Entrada Preserve addresses the open space area along the northern and southwestern boundaries, the proposed development area along the western boundary, the existing golf course located along the southern boundary, and Magic Mountain Boulevard located along portions of the eastern boundary, as shown on *Figure 23*.

The existing and proposed development areas and Magic Mountain Boulevard may result in adverse edge effects. Fencing, signage, access restrictions, easements, and other protections outlined in *Sections 9.2.1* through *9.2.7* are intended to address these adverse effects.

Fencing will extend along those portions of the preserve boundary that are adjacent to proposed and existing development and approximately 150 feet beyond the development areas to make a clear distinction between the FMZ and the preserve boundary.

The proposed development area includes portions of the watershed area of the preserve. Therefore, some storm drain outlets from the proposed development area may be necessary within the preserve to maintain pre-construction hydrologic conditions in the preserve. Hydrologic conditions will be maintained in conformance with *Section 9.2.7*.

This preserve contains a utility easement that is not under the control of Newhall; however, a good-faith effort will be made to coordinate with the easement holder to install a non-barbed wire or similar fencing with appropriate signage around any existing spineflower locations within the easement. Newhall cannot be responsible for spineflower within an easement held by others.

Portions of the preserve contain weeds that will be monitored and controlled as outlined in *Sections 10.2, 10.3,* and *11.0* in order to ensure they do not increase in cover or density and displace existing spineflower populations.

10.0 LONG-TERM MONITORING AND MAINTENANCE

The goal of long-term biological monitoring of the spineflower preserve areas is to track the viability of the spineflower populations and ensure the long-term persistence of spineflower within the project study area. This monitoring includes collecting, analyzing, and summarizing data in order to determine if action needs to be taken to maintain spineflower populations within the preserves. The objectives are to identify any unnatural declines in spineflower populations; reductions in occupied habitat acreage; increases in weed cover; new weed invasions; buildup of non-native thatch, encroachment of openings by annual grasses and, over the longer term, shrubs; excessive bioturbation; or other factors that could jeopardize the continued survival of spineflower. Additionally, monitoring will occur related to public uses and infrastructure. This Plan has been designed to detect problems affecting spineflower persistence so that remedial actions can be implemented in a timely manner to curb any unnatural downward trends in spineflower-occupied habitat and population levels. In general, unnatural declines are those not related to unusual weather patterns, flooding, fire, natural landslides, other ecological anomalies, or natural phenomena.

10.1 Performance Standards and Remedial Action Triggers

If annual report data reveal that spineflower-occupied acreage has declined for three consecutive years, and the decline does not correspond with years of low rainfall or other natural ecological factors like fire and/or there is a substantial population decline over a 10-year period, remedial measures will be initiated, as described in *Section 11.0.* If annual report data indicate that the spineflower-occupied acreage and populations within the preserves are in a state of decline 10 years after delineation of the preserves, monitoring data will continue to be obtained and annual reports will be required for an additional 5 years (in accordance with NRSP EIR Mitigation Measure 4.6-66 [County of Los Angeles]).

Given the disparity of SFVS occurrence data collected in the years 2002 (7,814 individuals), 2003 (5.9 million), 2004 (558,388), 2005 (7.4 million), and 2006 (1.8 million), it is not feasible to set performance standards at this time based on anticipated numbers of individuals. Therefore, the performance standards emphasize maintenance of occupied habitat area and include specific standards for factors likely to affect the suitability of the habitat to support spineflower.

The following performance standards and remedial action triggers have been established. If one or more of the performance standards indicated below is not met, remedial action will be triggered, as determined by the preserve manager and approved by CDFG.

PERFORMANCE STANDARDS FOR SPINEFLOWER POLYGONS

- Baseline data for percent cover of non-native vegetation will be collected during 10 consecutive springs, following certification of the Final EIS/EIR, from each preserve's significant spineflower polygons (polygons larger than 5 square meters). A performance standard for percent cover of non-native vegetation will be established upon completion of baseline data collection.
- Baseline data for area occupied by spineflower will be collected during 10 consecutive springs, following certification of the Final EIS/EIR, for each preserve. A performance standard for area occupied (and acceptable ranges) will be established upon completion of baseline data collection. Consideration will be given to the relationship of area occupied to lower than average rainfall, fire, or other natural events.
- Each preserve must be free of plant species on Cal-IPC List A and B, non-native plants listed by the U.S. Department of Agriculture (USDA) as noxious weeds, and any other highly invasive species that pose a direct threat to spineflower, as indicated by the preserve manager.
- If animal pests, including gophers or squirrels, are detected, they must be controlled as indicated in *Section 10.3.2*.

The number of spineflower individuals and the total area occupied may be related to climatic conditions, such as rainfall. During the first 10 years of monitoring, the occurrence and occupied area data will be evaluated each year in relation to average monthly rainfall and average monthly temperature. If the data can be correlated to measurable climatic conditions, it may be possible to establish annual performance standards based on the number of individuals and total occupied area within the preserves based on climatic conditions. Annual performance standards may also be amended as trends become apparent from analysis of the monitoring data over time.

PERFORMANCE STANDARDS FOR RESTORATION AREAS

- Percent cover by native species shall meet the following absolute cover criteria following restoration work:
    - Up to 30% herbaceous (less than 1 meter in height) cover and up to 50% bare ground by the end of year 1;
    - Up to 30% herbaceous, 10% shrub (greater than or equal to 1 meter in height) cover, and up to 40% bare ground by the end of year 2;
    - Up to 30% herbaceous, 20% shrub cover, and up to 30% bare ground by the end of year 3;
    - Up to 30% herbaceous, 30% shrub cover, and up to 20% bare ground by the end of year 4; and
    - Up to 30% herbaceous, 40% shrub cover, and up to 10% bare ground by the end of year 5.
- Non-native annual grass cover shall be kept below 10% cover.
- Non-native vegetation (excluding annual gasses) must be kept below 10% cover.
- Thatch shall be kept below 10% cover.
- Each preserve shall be free of plant species on Cal-IPC List A and B, non-native plants listed by the USDA as noxious weeds, and any other highly invasive species that pose a direct threat to spineflower, as indicated by the preserve manager.
- If animal pests, including gophers or squirrels, are detected, they must be controlled as indicated in *Section 10.3.2*.

PERFORMANCE STANDARDS FOR EXISTING NATIVE HABITAT AREAS WITHIN THE PRESERVES

- Baseline data for percent cover of non-native vegetation will be collected during 10 consecutive springs, following certification of the Final EIS/EIR. Baseline data will be collected utilizing the Vegetation Rapid Assessment Protocol (CNPS 2004a). A performance standard for percent cover of non-native vegetation will be established upon completion of baseline data collection.

- Baseline data for depth of thatch will be collected during 10 consecutive springs, following certification of the Final EIS/EIR. A performance standard for thatch will be established upon completion of baseline data collection.
- Each preserve must be free of plant species on Cal-IPC List A and B, non-native plants listed by the USDA as noxious weeds, and any other highly invasive species that pose a direct threat to spineflower, as indicated by the preserve manager.
- If animal pests, including gophers or squirrels, are detected, they must be controlled as indicated in *Section 10.3.2*.

If any of the above-indicated performance standards are not met, remedial actions shall be recommended by the preserve manager, reviewed by CDFG, and implemented in a timely fashion—generally within 30 days, unless there are extenuating circumstances.

10.2 Initial Monitoring

10.2.1 Qualifications

Monitoring shall be conducted under the direction of the preserve manager or the NLMO, as approved by the CDFG. The preserve manager, NLMO, and/or staff collecting data shall meet the qualifications described in *Section 9.0* and be familiar and experienced with the monitoring and data collection techniques outlined herein.

10.2.2 Monitoring Time and Frequency

Monitoring of the preserve will be performed quarterly (seasonally) for 10 years. Fall and winter quarter monitoring will be mostly qualitative in nature, while summer and spring quarter monitoring will include both qualitative and quantitative data collection. Quantitative monitoring may also be undertaken at other times of the year, depending upon the specific information that needs to be obtained and/or unusual weather patterns. Initial monitoring and reporting will be performed for at least 10 continuous years. If the success criteria are met for 5 consecutive years, monitoring may be reduced to every fifth year. However, if at any point the success criteria are not met, annual monitoring shall re-commence until the success criteria again have been met for 5 consecutive years.

10.2.3 Monitoring Methods

10.2.3.1 Quantitative Monitoring

Generally, quantitative monitoring and data collection will be performed each summer when a majority of spineflower has fruited, California sagebrush scrub species are in their annual growth cycle, and a majority of herbaceous ephemeral native and non-native species are present. Quantitative monitoring will involve annual mapping of occupied spineflower polygons to track annual changes in the footprint of occupied areas and the collection of quantitative data using quadrat sampling to estimate spineflower density and plant size (height and diameter), and to monitor habitat characteristics using visual estimates of cover. Annual spineflower mapping will be conducted to cover 100% of the spineflower present. Quantitative monitoring will only be conducted within a subset of composite polygons. Initially, quantitative monitoring should be conducted within the same subset of composite polygons from year to year. In the future, however, the subset of polygons that are monitored could be varied selectively or randomly in order to sample a greater proportion of the overall spineflower population.

Spineflower Mapping

Spineflower populations will be mapped each spring using GPS equipment with sub-meter accuracy. All spineflower plants within 4 meters of each other will be included in the same polygon. Each polygon will be given a number that will remain the same throughout the long-term monitoring period. GPS data will be downloaded onto a geo-referenced topographic base map of the preserve using GIS and AutoCAD software. Spineflower maps, which will be included in each annual report, include the area of each polygon and the total area of spineflower-occupied habitat listed in square meters. These data will allow monitoring to identify and track changes in polygon size, shape, and location. Spineflower maps will include the polygons from the previous years (as an overlay) to allow comparisons of polygon sizes, shapes, areas, and locations.

Quantitative Spineflower Data

The largest populations/polygons of spineflower to date were mapped in spring 2003 and 2005, but in neither year was the entire footprint of spineflower occurrence occupied. Therefore, for the purposes of future monitoring of populations, the cumulative footprint will be used. The cumulative footprint identifies the limits of composite polygons formed by overlapping spineflower polygons mapped in different years. The polygons will be adjusted annually based

on annual mapping data collected using GPS units with sub-meter accuracy. Because the spineflower footprint will grow each year for a number of years, analyses will always be undertaken with the most recent documented cumulative footprint. A qualified statistician will work with the biologists to develop the protocols and oversee initial implementation and data analysis.

The 2006 Spineflower Monitoring Pilot Study implemented the monitoring protocol originally proposed in the October 2005 Draft Spineflower Conservation Plan. This included collection of transect data at prescribed rates to monitor habitat characteristics, and collection of quadrat data at prescribed rates to estimate spineflower density. Based on the recommendations of the 2006 pilot study, and based on acknowledgement by CDFG that current spineflower performance criteria tied to changes from baseline levels of vegetation cover need to be changed, transect data will not be collected for the 2007 pilot study. Instead, habitat characteristics will be monitored using visual estimates of cover made within each sampled quadrat. The primary reason to originally monitor habitat characteristics using transects rather than visual estimates of cover was to ensure sufficient statistical power to detect a 10% change in baseline vegetation cover (which, in turn, would trigger management actions if the 10% threshold was exceeded). However, given that changes in baseline vegetation cover at the polygon level are no longer being considered a useful means of establishing performance criteria, it is now proposed that monitoring habitat characteristics be achieved at a finer scale (i.e., sub-polygon level) by using visual estimates of cover within quadrats.

Quadrat sampling will be conducted randomly using an “index line” representing the longest axis of the polygon as a basis for locating quadrats. Index line end points were located in the field during the 2006 pilot study using GPS units with sub-meter accuracy and permanently marked using 12-inch rebar staked into the ground. Quadrat data collection will be performed when a vast majority of spineflower has fruited to avoid impacts to spineflower.

Quadrat data for spineflower will be collected using 0.50-square-meter rectangular quadrats (1.0 by 0.5 m). Quadrat data will record the number of spineflower present within each quadrat, as well as the diameter and height of up to 10 spineflower plants in quadrats where spineflower is present.

Quadrats will also be collected to monitor habitat characteristics within polygons, including the percent cover of each species, species composition, distribution, cover and nature of bare ground, cover and depth of non-native thatch, the range in height of non-native grass species within each quadrat, and soil moisture. Species occurring within each quadrat will be recorded in the field,

and the relative cover of each species will be visually estimated and recorded using the following cover intervals: <1%, 1-5%, 5-15%, 15-25%, 25-50%, 50-75%, and >75%. A minimum and maximum height will also be recorded for each grass species identified according to the appropriate height range (i.e., 0-1.0 decimeters, 1.01-2.0 decimeters, 2.01-3.0 decimeters, 3.01-4.0 decimeters, 4.01-5 decimeters, 5.01 decimeters up to the maximum height). Data regarding the surface conditions will also be collected by noting the presence and relative cover of the different ground conditions (i.e. bare ground, cryptogramic soil crust, rock, burrows, non-native thatch). If thatch is present, its depth in centimeters will be recorded. These data will be tabulated, graphed, analyzed, and compared to the previous year's data in each annual report.

Soil moisture will be measured using an Aquaterr EC300 (Aquaterr Instruments Incorporated, Costa Mesa, CA, 93637, USA) soil moisture probe, or similar device. Soil moisture will be measured within 13 centimeters of the soil surface and recorded on field data forms.

The number of randomly placed quadrats within each sampled polygon will range from 20 to 80 quadrats, depending on the size of the polygon footprint (i.e., polygon area) as shown in *Table 19*. For the 2007 pilot study, however, 20 quadrats will be sampled from each polygon regardless of polygon size. The primary reason for increasing the number of quadrats sampled with increasing polygon size as shown in *Table 19* is to minimize the variance of spineflower density estimates. Since spineflower populations in 2007 may represent the lowest recorded levels since the species was discovered on Newhall, sampling upwards of 20 quadrats this year is not likely to have an appreciable effect on the estimated variance of spineflower density (i.e., it is expected that nearly all quadrats sampled will not have any detectable spineflower at all, so sampling additional quadrats will have a very limited effect on mean or variance estimates of spineflower density).

Quantitative monitoring within polygons that are less than 10 square meters in size will be limited to collecting spineflower quantity data through a complete census of spineflower within the polygon (*Table 19*).

Table 19
Sampling Rate for Quadrat Data

Polygon Size (m^2)	Recommended No. of Quadrats
< 10	Complete census recommended
10 – 100	20
100 – 1,000	40
>1,000	80

In addition to the quadrat data, photographs will be taken of spineflower populations from permanent photo-documentation stations. Index line end points will serve as the permanent photo stations. In addition, overall preserve photographs will be taken from various vantage points to ensure that the majority of the preserve area is captured. These additional photo stations will be marked with a metal stake and embossed aluminum tag. Color photos from each photo station will be included with each annual report. In addition, photographs of each quadrat sampled will be taken so that alternative methods of estimating cover using computer software can be evaluated in the future.

Estimating Spineflower Numbers

Spineflower numbers will be estimated each spring and compared to data from previous years. Spineflower are small annual plants that vary greatly in number of individuals, size, and vigor from year to year. In addition, they are not randomly distributed; instead, they grow in clumps of varying density, and sometimes small plants occur beneath larger plants, making detection of individuals difficult. Accurately measuring the quantity and year-to-year variation of spineflower individuals will be based on quadrat sampling. The number of quadrats will be high initially and possibly reduced in the future depending on the observed results. In highly aggregated populations such as spineflowers, it is preferable to have more samples, even if they sample a smaller total area (Hayek and Buzas 1997), so the quadrat area has been reduced from 1 square meter to 0.5 square meter and the total number of quadrats has been increased relative to the sampling reported in the pilot study (Dudek 2006).

Spineflower numbers will be estimated each spring using 0.5-square-meter rectangular quadrats at the rates indicated in *Table 19*. Due to the large number of quadrats and because data should be collected as synchronously as possible, several biologists will most likely be involved in collecting data. Therefore, each spring, before the quadrat data are collected, the lead biologist

will count the number of spineflower individuals in 10 quadrats of varying densities. The team of biologists will then meet to calibrate estimation methods by reviewing the 10 quadrats and their estimates. The lead biologist will then inform others of the actual number. Where estimates deviate by more than 10%, the estimation method will be reviewed and corrected. Once the lead biologist is confident that the team is calibrated and accurate to within 10%, quadrat data collection will commence.

Quantitative Monitoring of Habitat Restoration Areas

Quantitative monitoring of habitat restoration areas will include 50-meter-long point-intercept transects, at approximately the rate of one per acre. Transect data will be collected in the spring, as the vast majority of the restoration areas will be sage scrub or native grasslands. Data will be collected using the point-intercept method at each 0.5 meter along the transect line. At every 0.5 meter, a point will be projected vertically into the vegetation. Species intercepted at each point will be recorded, providing a tally of intercepts for each species in the herb and shrub layers. A column will be included to indicate if a non-native thatch layer is present and, if so, the depth in centimeters. In addition, grass species intercepted will be recorded according to their appropriate height range (i.e., 0-1.0 decimeters, 1.01-2.0 decimeters, 2.01-3.0 decimeters 3.01-4.0 decimeters, 4.01-5 decimeters, 5.01 decimeters up to the maximum height).

Transect data will be analyzed to determine the percent vegetative cover of each species, species composition, species frequency, distribution, percent bare ground, percent and depth of non-native thatch, and average grass height along each transect. Quantitative transect data will be tabulated, graphed, analyzed, and compared to the previous year's data in each annual report.

Monitoring of Preserve Area Vegetation

Existing stands of vegetation within preserve areas that do not support known spineflower populations will be assessed utilizing the CNPS Vegetation Rapid Assessment Protocol (CNPS 2004a). This protocol has been adopted by CDFG, USFWS, and the National Park Service to assist them in effectively and efficiently updating the location, distribution, species composition, and disturbance information of vegetation types identified in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). Vegetation types are classified by general physical location, general habitat, alliance, and association. Mapping will be conducted to the association level, the most refined within *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). The protocol, in summary, includes assessing stands of vegetation by field-analyzing it, photographing it from at least two vantage points, and filling out a field data form for each stand.

As defined by *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995), a stand is a basic physical unit of vegetation in the landscape that has compositional and structural integrity (homogeneity).

In addition, while monitoring continues, new aerial photos of the preserves will be obtained every 5 years and compared against the previous aerial photos to identify any disturbances and gross changes or trends in vegetative cover.

10.2.3.2 Qualitative Monitoring

Qualitative monitoring will be performed quarterly and include an overall review of the spineflower populations and habitats within the preserve and preserve buffer. The monitoring will note physiognomic changes and potential problems, such as invasion or increase in cover by exotic species or weeds, plant pests, Argentinean ants, gophers, squirrels, plant diseases, erosion, sedimentation, trash accumulation, unauthorized access, and vandalism. The monitoring will also make recommendations as necessary to help ensure that spineflower populations remain in a healthy state. Special attention shall be placed on examining preserve edges, as these locations are where new weed invasions and other problems are often first detected. Quarterly assessments will also include a review of the preserve's physical features, including the condition of protective fencing, preserve signage, access gates, locks, adjacent storm-drain outfalls, and BMPs.

Qualitative monitoring will include quarterly qualitative reports that are prepared by the preserve manager (based on direct observation) and submitted to Newhall and CDFG. The reports will summarize the monitoring site visit, identify potential problems, and prescribe appropriate remedial actions when necessary, to protect spineflower populations. Quarterly reports will be included as appendices of the annual reports. Every 5 years, an aerial photo of the preserves will be obtained, assessed qualitatively, and included in the annual reports. The impetus of the aerial photo assessment will be to identify changes or trends in vegetative cover, specifically weeds and annual grasses, and respond with management and maintenance actions according to the performance standards.

10.2.4 Reporting

Annual reports will be prepared and submitted to Newhall, the County,, and CDFG by December 31 each year for 10 continuous years and/or until the performance standards outlined herein are met. One comprehensive report will be submitted for all spineflower preserve areas.

Each report will include updated spineflower maps that include the estimated number of spineflower individuals (from quadrat data), each polygon size and the total area occupied by spineflower. Reports shall include a discussion of any changes in occupied acreage and will include figures and tables needed to indicate trends in occupied acreage over time. Updated maps will be included each year for comparative analysis and to track and indicate population trends over time.

Annual reports will include tabular and graphed transect and quadrat data, including percent cover by each species, species composition, percent annual grass with grass height, percent bare ground, nature of bare ground, species distribution, percent non-native thatch and depth of thatch, and species richness. Quantitative data from each year's transects and quadrats will be presented together for comparative analysis and to determine changes or trends in vegetative cover.

The quantitative data will be analyzed and findings summarized. Any significant changes or anomalies, such as a notable increase or decrease in spineflower populations or weed cover, will be analyzed and the likely reason for the anomaly described (e.g., unusually high or low rainfall amounts, abnormal rainfall patterns, unusual weather, predation by herbivores, fire, new impacts).

Color photographs from pre-determined permanent photo-points will be included in each annual report. The beginning point of transects will serve as permanent photo-points. In addition, the reports will include at least 10 photos of each preserve from different vantage points. Photos will be analyzed and compared to the previous year's photos to help further identify changes or trends in preserve vegetation.

Annual reports will include a summary of qualitative data, including the condition of protective fencing, signage, erosion, trash accumulation, unauthorized access, and vandalism, and indicate the presence of ants, gophers, squirrels, or other potentially problematic species. Annual reports will determine if remedial action triggers have been incurred and, if so, include recommendations for remedial actions to bring the preserve and preserve buffers into compliance with the performance standards.

10.3 Maintenance Activities

Preserve maintenance shall be performed at the direction of the preserve manager. Preserve maintenance shall include controlling invasive weed species and performing weed control and

management as necessary to maintain the preserves in compliance with the performance standards. Preserve maintenance shall also include removing accumulated trash, repairing broken or damaged fences, gates, locks, signage, and other preserve-related items on a quarterly basis. In addition, maintenance shall include controlling plant diseases and animal pests determined by the preserve manager to be significant to the survival of spineflower or its habitat.

10.3.1 Weed Control

Weeding efforts shall consider the overall preserve goal, which is to promote the long-term survival of spineflower. Prior to applying herbicides, it shall be determined by the preserve manager that the proposed herbicide, when applied per the labeled directions, will not directly or indirectly affect spineflower plants, dormant seed, or associated pollinators or cause a significant or prolonged decline. Weed-control measures within the spineflower preserves shall be pre-approved by the preserve manager and CDFG in writing. Recommendations for herbicide use shall be prescribed by a PCA, and applied by a licensed or certified pesticide applicator, as required by law.

All weed-control work shall be supervised by a qualified foreman capable of readily distinguishing weeds from native plants. Where weed-control work is needed within occupied spineflower habitat, the preserve manager and/or botanical monitor will be present to monitor all work. Weed-control work shall utilize IPM techniques that focus on avoiding and minimizing potential weed invasion problems by minimizing soil disturbance and quickly controlling any new populations of invasive weed species before they spread and colonize. When weed-control work is determined to be necessary, the least damaging, most selective method(s) available shall be used. Weed-control work shall be carefully timed to control weeds before they set seed. Weeds should be controlled as early as effectively possible to minimize the amount of biomass produced, using methods that focus on reducing the weed seed bank, the amount of thatch, and weed biomass.

Weed control and management will focus on controlling annual weeds seasonally. Methods used for weed control may include string trimmers, mowers, and/or herbicide treatment using truck-mounted tank sprayers, backpack sprayers, and wicking or daubing devices. Maintenance personnel must have a fire extinguisher with them or in the immediate vicinity when operating mechanized equipment in preserve areas.

Weeding in areas that are dominated by native plants shall be performed using non-mechanized hand tools or herbicide daubers/wicks.

Weeds may also be controlled by a well-managed, timed, and monitored livestock grazing regime. Any proposed animal grazing shall be accompanied by a grazing plan prepared by the preserve manager and approved by CDFG. The grazing plan shall indicate the type of animal(s) used for grazing, the area to be grazed, the grazing time frame, the anticipated time of rotation from area to area, methods proposed to keep livestock out of non-grazing areas, and the proposed monitoring regime. Livestock shall be closely monitored and moved/rotated to prevent overgrazing. Grazing shall be timed to graze exotic grasses before the seed become ripe. Stands of native vegetation and spineflower populations shall be protected during grazing operations by temporary fencing.

If burn permits can be obtained from the necessary agencies, burning may be used as a method of weed control and management within the preserves. Burning would be used only in preserve areas that are strongly dominated by non-native grasses and weeds. "Strongly dominated" shall mean at least 90% weed cover. Burns would need to be prescribed by the preserve manager and approved by CDFG. The proposed burn date, location, and methods would need to be provided in advance to CDFG. It is most likely that this method would be implemented before any development has commenced.

Any large perennial exotic species, including exotic trees, will either be grubbed out and removed, or cut to grade and treated with the appropriate systemic herbicide. Resprouts of exotic species will be controlled quarterly before they get large. The method of control will depend on the situation; for example, if grubbing exotic species' rootballs would exacerbate erosion or likely damage nearby native plants, rootballs would be cut to grade and stump treated. In general, weeds and exotic species will be controlled using the methods indicated in *Invasive Plants of California's Wildlands* (Bossard et al. 2000), and in accordance with the directives of the Department of Pesticide Regulation.

All maintenance work will be closely monitored by the preserve manager. Preserve management is intended to be adaptive, and, therefore, maintenance methods are subject to changes and adjustments as deemed necessary by the preserve manager to help ensure the most effective methods are used to ensure preservation and perpetuation of the spineflower. Any changes in methodology, however, will be prescribed by the preserve manager in writing and subject to approval by CDFG.

10.3.2 Pest Control

Pest control is not anticipated to be required in the preserve areas on a regular basis. However, it is possible that gophers, squirrels, rabbits, and other animals may need to be at least periodically controlled in preserve areas. In addition, if an herbivore is identified foraging on spineflower plants or plants installed during revegetation efforts, and the damage is determined by the preserve manager or CDFG to be significant, it may need to be controlled. In revegetation and restoration areas, exclusionary fencing or caging may be necessary to aid establishment.

The control methods will be dependent on the species that needs control; however, pest control will utilize IPM techniques. Impetus will be placed on using controls, such as exclusionary fencing, rodent traps, fake owls, scarecrows, and reflective silver ties. Plant shelters and gopher cages may be used on new plantings in restoration areas. All control methods will be prescribed in writing by the preserve manager and subject to the approval of CDFG at least 2 weeks in advance.

Insect control is not anticipated to be needed on a regular basis but may be more likely once the surrounding areas are developed, especially along the urban fringes and/or habitat restoration areas where establishing plants are more likely to become stressed and, therefore, predisposed to insect infestation. Although not expected, severe infestations of insects determined by the preserve manager or CDFG to be detrimental to the survival of a significant number of native plants or spineflower shall be controlled using the least toxic controls available, including sticky yellow insect strips, non-copper horticultural oils, and biological controls, such as ladybugs, damsel bugs, green lacewings, and/or minute pirate bugs. As indicated above, all control methods will be prescribed in writing by the preserve manager and subject to the approval of CDFG at least 2 weeks in advance.

11.0 ADAPTIVE MANAGEMENT AND REMEDIAL MEASURES

This section describes the adaptive management program and remedial measures for the preserve areas. Preserve management and remedial actions will be adaptive and based on the annual assessments and may include adjusting management techniques and trigger points/performance standards based on quantitative data collected during initial and long-term monitoring. These adjustments would be made upon approval of CDFG. For example, if there is strong evidence indicating that removal of exotic grasses using livestock instead of string trimmers or mowing results in increased spineflower recruitment or percent cover, the preserve maintenance techniques may be adjusted by the preserve manager accordingly. Similarly, if quantitative data

reveal a strong correlation between the depth of exotic grass thatch and spineflower vigor or percent cover not tied to rainfall or other climatic variables, the trigger point/performance standard for thatch removal may be adjusted accordingly. These adjustments would be made upon approval of CDFG.

In general, remedial measures will include implementing management tasks outlined in *Section 9.3*. Should new methods arise that can more effectively maintain spineflower habitat and population levels, this program may be augmented or adjusted in the future, with approval of the CDFG.

11.1 Wildfire/Geologic Events

In the event that a preserve or a portion of a preserve burns in a wildfire or suffers from mass movements (e.g., landslides, slope sloughing, or other geologic events), the preserve manager and Newhall shall promptly review the site and determine what action, if any, should be taken. The primary anticipated post-fire preserve management activity involves monitoring the site and controlling annual weeds that may invade burned areas following a fire event, especially when such weeds that were not previously present or not present in similar densities present an imminent threat to the survival of spineflower populations. If fire-control lines or other forms of bulldozer damage occur in the preserves, these areas would be repaired and revegetated to pre-burn conditions or better. An Emergency Fire Response Plan will be prepared prior to the establishment of the preserves and approved by CDFG and Los Angeles County Fire Department.

In general, a burned site will be left to recover naturally from wildfire or geologic events. The California sagebrush scrub habitat types within the preserve are well adapted to recover from wildfires unless the fire frequency is artificially increased (Holland 1986). Therefore, burned areas shall not be seeded or sprayed with soil stabilizer, straw, or hay. The latter two items are usually contaminated with various problematic weed seeds and often include noxious weed seed. It should be noted that several species of weeds not considered to be noxious by the USDA may be considered a noxious weed in natural preserve areas and, if introduced, would be very expensive to control/eradicate. In addition, active post-fire revegetation and soil stabilization efforts interfere with natural post-fire successional species and vegetation development stages that should be allowed to occur for the habitat to properly recover and regenerate.

Erosion and ash distribution is an expected and naturally occurring event following a wildfire and is part of the ecological cycle. Therefore, erosion-control devices, including seeding, straw

wattles, and soil tackifiers, should be avoided following a fire event for the aforementioned reasons. An exception to this would be fires that occur at a higher-than-average frequency, which may artificially accelerate erosion processes. This situation is to be evaluated by the preserve manager. Imminent and unavoidable threats to human health, safety, and welfare represent another exception to this passive management approach in post-fire conditions. Fire frequencies have a tendency to increase at the urban-wildland interface. If the preserves are subject to a greater-than-natural fire frequency, the guidelines outlined herein shall be followed to help ensure that the preserves recover to a natural state.

When deemed necessary for the aforementioned reason (i.e., fires that occur at a higher-than-average frequency that may artificially accelerate erosion processes), the preferred erosion-control devices to be used include fabric silt fencing, gravel or sand bags (made of biodegradable burlap), straw wattles certified as weed free (not just free of "USDA noxious weeds" but free of all weeds), and judicious seeding with locally indigenous native species free of weed seed. Seed shall be tested by a certified laboratory, and all weed seeds identified by species. The quantity of weed seed shall be indicated in units of quantity of weed seed per pound of native seed and sorted by size and weight to eliminate weed seeds determined to be noxious or problematic by the preserve manager.

Items that often include problematic noxious or invasive weed seeds should be avoided. These include hay and straw bales, non-certified wattles, and non-native, non-locally indigenous seed species.

The same passive successional regeneration holds true for mass-movement, landslide, or slope-sloughing types of events. Some plant species, quite possibly including spineflower, have evolved and/or adapted to recruit into these types of geologically disturbed areas.

11.2 Restoration and Enhancement Activities within Preserve Areas

Restoration of disturbed portions (i.e., agricultural lands, disturbed lands, and developed lands) of the preserves will be performed as outlined in *Section 9.2.3*. In summary, areas that have greater than 30% cover by weeds (not including annual grasses) will be restored to have at least 70% native cover. In addition, Cal-IPC List A and B plants that are present within the preserve will be controlled. Restoration and enhancement efforts within the preserve shall be performed in such a manner that the overall spineflower habitat is improved, if only by reducing the quantity of weeds within the preserve. Spineflower shall not be negatively impacted directly or

indirectly by restoration or enhancement. Therefore, proposed restoration and enhancement projects shall be reviewed by CDFG and will not be implemented without CDFG approval.

Restoration and enhancement projects shall utilize only locally indigenous plants appropriate to the habitat being restored or enhanced. Plants and seed shall be from the local region and from similar elevations; that is, no more than 20 miles from the site and no more than 300 feet elevational difference. Seed shall be tested prior to delivery to ensure it is free of problematic weeds, pests, and disease. Restoration efforts will focus on the use of seed and only include container plants when seed is not available or able to be collected in a reasonable amount of time or if germination of a particular species from seed is documented as difficult and/or typically requires specific conditions, such as fire, scarification, or acidification.

Habitat restoration sites may be temporarily irrigated to establish native plants and seed. If irrigation is utilized, it shall not alter pre-existing hydrologic conditions within the preserve areas and shall be programmed to eliminate runoff. In addition, the system shall be used to establish plants and be scheduled to acclimate them to natural rainfall cycles. Temporary irrigation systems, which will be subject to pre-approval by the CDFG, shall be removed after a maximum of 5 years. Temporary erosion-control devices may be used during restoration and enhancement work to prevent rills and gullies from forming and associated sedimentation and/or stream turbidity. Erosion-control devices may include native, locally indigenous hydroseed mix, fabric silt fences, biodegradable burlap sand bags, or other pre-approved devices. Hay and straw bales, wattles, and other devices that often host weed seeds shall be avoided. Erosion-control devices shall be removed once the site is adequately vegetated.

Habitat restoration and enhancement plans (including restoration plans) for areas within the preserves shall be prepared at the direction of the preserve manager by a qualified biologist and submitted to the County and CDFG for approval prior to implementation. Restoration and enhancement plans shall include the following information at a minimum:

(1) Maps showing the exact location and acreage of the site;
(2) A description of the restoration project and proposed methodology;
(3) Project proponent;
(4) Name of biologist that prepared the plan;
(5) Map and description of the existing habitat, adjacent habitat, and proposed habitat;
(6) List of proposed plant and seed species;
(7) Plant origins;
(8) Container sizes;

(9) Species composition;
(10) Weed control;
(11) Fertilizers/nutrient immobilization;
(12) Installation schedule;
(13) Proposed monitoring and maintenance schedule and activities; and
(14) Performance standards.

Seeds shall meet the requirements indicated herein and container plants shall be inspected by the preserve manager for weeds, disease, and the presence of pests, including Argentine ants, prior to delivery to the site and during delivery. Plants with pests, weeds, or diseases shall be rejected and immediately removed from the site. Mycorrhizal inoculation shall be used in areas where the soil is damaged.

12.0 SPINEFLOWER INTRODUCTION PROGRAM

If CDFG determines that avoidance and minimization efforts and establishment of the preserves are not adequate to substantially lessen the significance of direct and indirect impacts to the spineflower, a reintroduction program may be implemented.

12.1 Conservation of the Seedbank

Spineflower seed shall be collected from spineflower areas in the development area(s) permitted for "take," prior to clearing and grubbing. Seed collection shall follow the approved seed collection protocol described in the October 8, 2003, CDFG letter to Newhall authorizing collection of spineflower seed (CDFG 2003b). A copy of this letter is attached to this Plan as *Appendix C*, and incorporated herein by reference. Two-thirds of the collected seed will be sent to RSABG for storage (one-third short-term and one-third long-term storage), and one-third will be sent to the USDA National Seed Storage Lab in Fort Collins, Colorado, for long-term storage.

12.2 Seed Collection

In addition, approximately 5% of seed will be collected in each preserve area each year, only in years of within 20% or greater of normal rainfall, for 10 years, beginning in the year the preserves are established. This seed will be maintained in short-term storage at RSABG and may be used for seeding, as discussed in *Section 12.3*, below.

12.3 Seeding

Seeding of spineflower in the preserves may be performed to create additional spineflower occurrences. Direct seeding may be performed as a remedial measure in association with, or following, other remedial actions identified during monitoring. Direct seeding in a preserve area would only utilize seeds from that preserve area, it would not involve seeds collected from development areas or other preserves. In the event that the performance standards described in *Section 10.2* are not met, direct seeding of existing populations may occur at the discretion of CDFG.

A direct seeding plan shall be developed for spineflower mitigation/creation areas that includes the following data:

(1) Scaled topographic maps showing the accurate locations and acreages of the proposed seeding areas;

(2) A detailed description of proposed (site specific) methodology;

(3) Name of biologist that prepared the plan;

(4) Map and description of the habitat(s) adjacent to the seeding area;

(5) List of plant species and densities present within the seeding area;

(6) The project schedule; and

(7) Plans and specifications for site preparation, seed application, and maintenance methods.

The direct seeding plan, which includes proposed monitoring and maintenance schedules and activities, shall be submitted to CDFG for input and approval prior to implementation.

In general, direct seeding will include identifying locations within the preserves areas with appropriate soils, geology, aspect, slope, and vegetation conditions that have no historical occurrences of spineflower. Only seed collected from the particular preserve area shall be introduced within that preserve in order to preserve the genetic integrity of the spineflower populations. Once the appropriate area(s) is identified and approved by CDFG, the site shall be adequately prepared by staking the boundaries, removing weeds and debris, and applying seeds. Seeding shall be performed at the onset of the rainy season (October through early December).

Seeding will be applied using two methods. The first method will use a calibrated hand or "belly" spreader and mix the seed with clean masonry sand or inert bran fiber for better distribution. Immediately following application, the seed shall be lightly raked into the soil to 5 mm depth (max.) using a steel rake. This method will be used for approximately 60% of the spineflower mitigation/creation areas. The second method will use a seed imprinting device that has ripping teeth in front of the imprint wheel and a calibrated seed bin. This method shall be used for approximately 40% of the direct seeded area. This method mimics a natural disturbance situation and has proven to be highly effective for seeding native plants in non-irrigated situations. Imprints shall be parallel with the contours, "v" in shape, and between 3 and 4 inches deep. Imprinting teeth shall be offset to prevent channeling of water. Imprinting shall not occur on slopes steeper than 3:1. Imprinted areas shall be covered with blown straw certified as weed-free at the rate of 2,000 pounds per acre.

The rate of seeding will be dependent on the seed purity, percent germination, individual site conditions, and the quantity of seed available. Therefore, the seeding rate (to be expressed in pounds per acre) will be calculated by the project biologist and submitted to CDFG for review. Fifty percent of the seed shall be pretreated by clipping the seed coats, as previous studies (Sapphos 2001) have determined that germination rates were dramatically increased by clipping seed coats.

In areas where herbivores, including birds, are known or expected to be problematic, the seeded areas should include temporary exclusion fencing and/or bird deterrents, such as silver tape attached to posts, artificial owls, or other pre-approved devices. All spineflower direct seeding work shall be monitored by the preserve manager and reported to CDFG.

13.0 FUNDING

Newhall, or a designee, would post bonds for the management, monitoring, and reporting measures described in *Sections 9.0, 10.0, 11.0,* and *12.0*. *Table 20* depicts the costs of the management measures for existing agricultural activities during construction and after construction, as well as costs associated with monitoring and reporting requirements. Two bonds would be posted, one for $2,310,940.00 for costs during construction and one-time start-up costs and one for $5,630,200.00 for costs to be expended over a 50-year period. Thus, the total bond amount required for implementation of this Plan would be for $7,941,140.00.

Table 20
Operation Costs for Maintenance, Monitoring, and Management Measures

Activity	Frequency	Person-hours or Cost Unit	Cost per Year
Management Measures for Existing Agricultural Activities			
Installation of signs (82 signs)	Once	Fixed cost	$4,100
Erosion-control measures	Once	Fixed cost	$20,000
Subtotal One-Time Costs			**$24,100**
Management Measures during Construction			
Installation of orange snow fencing (32,685 linear feet)	Once	Fixed cost	$98,000
Erosion control (silt fence 10,395 linear feet)	Annually	Fixed cost	$19,250
Training construction personnel about the spineflower	Annually	3 (@ $110)	$330
Construction monitoring	Annually	400 (@110)	$44,000
Subtotal for 3 Years Construction			**$288,740**
General Management Measures and Monitoring for the Preserves			
One-Time Costs			
Landscape Palette Review and Nursery Stock Inspection	Once	Fixed cost	$6,000
Landscape Planting within Preserves (66.8 acres @$25,000/acre)	Once	Fixed cost	$1,670,000
Landscape Planting within Preserves (5 Years of Monitoring)	Quarterly for 5 years	Fixed cost	$125,000 (5 years)
Installation of signs (42 signs)	Once	Fixed cost	$2,100
Installation of split rail fencing (17,090 linear feet)	Once	Fixed cost	$170,900
Subtotal One-Time Costs			**$1,974,000**
Years 1 through 10			
Spineflower seed collection	Annually for 10 years	Fixed cost=$3,000/year	$30,000 (10 years)
Spineflower seed storage	Annually for 10 years	Fixed cost=$3,000/year	$30,000 (10 years)
Reporting (quarterly and annual)	Annually for 10 years	100 (@ $110)=$51,000/year	$510,000 (10 years)
	Quarterly for 10 years	20 (@ $110)=$2,200/quarter ($8,800/year)	$88,000 (10 years)
Reporting (quarterly and annual)	Annually for 10 years	100 (@ $110)=$11,000/year	$110,000 (10 years)
Subtotal Annual Costs Years 1 through 10			**$768,000**
Years 11 through 50			
Quantitative monitoring (177 acres at 20 acres per 10-hour day)	Annually for 50 years	100 (@ $110)=$51,000/year	$2,040,000 (40 years)
Qualitative monitoring (177 acres at 100 acres per 10-hour day)	Quarterly for 50 years	20 (@ $110)=$2,200/quarter ($8,800/year)	$352,000 (40 years)
Reporting (quarterly and annual)	Annually for 50 years	100 (@ $110)=$11,000/year	$440,000 (40 years)
Subtotal Annual Costs Years 11 through 50			**$2,832,000**

Table 20
Operation Costs for Maintenance, Monitoring, and Management Measures

Activity	Frequency	Person-hours or Cost Unit	Cost per Year
Maintenance Measures			
Pest control	Annually	40 (@ $110)=$4,400/year	$220,200 (50 years)
Weed control	Quarterly	80 (@ $40)=$12,800/year	$640,000 (50 years)
Maintenance activities (repairing fencing, signage; trash removal)	Quarterly	40 (@ $40)=$6,400/year	$320,000 (50 years)
Subtotal Annual Costs Years 1 through 50			**$1,180,200**
Adaptive Management Measures			
Monitoring and removing trash	Quarterly	120 (@ $30)=$3,600/quarter	$14,400/year
Reporting	Annually	20 (@ $130)	$2,600/year
Subtotal Annual Costs			*$17,000*
TOTAL COSTS			
Management Measures for Existing Agricultural Activities			**$24,100**
Management Measures during Construction			**$288,740**
Total One-Time Costs			**$1,998,100**
Total Annual Management Costs for Years 1 through 10 ($60,000 per year for 10 years)			**$768,000**
Total Annual Management Costs for Years 11 through 50 ($70,800 per year for 40 years)			**$2,832,000**
Total Annual Maintenance Costs ($23,604 annually for 50 years)			**$1,180,200**
Total Adaptive Management Measures ($17,000 annually for 50 years)			**$850,000**
Total Costs for 50-Year Period			**$7,941,140**

14.0 RESPONSIBLE PARTIES

Newhall, or a designee, would be responsible for implementing this Plan. Newhall, or a designee, would post bonds for the management, monitoring, and reporting measures in *Sections 9.0, 10.0,* and *11.0*. The assigned party may include the Center for Natural Lands Management or another assigned party responsible for overseeing the open area and river corridor portions of the NRSP. Bonds shall be released by CDFG upon reaching identified milestones and/or upon receipt of verification of grants or special assessments obtained to implement this Plan.

15.0 REPORTING

This section identifies the reporting requirements associated with the five preserve areas of this Plan. It is anticipated that the five preserve areas will be established within the year of Section 2081 permit (California Fish and Game Code, Section 2081) issuance by CDFG under CESA but that the assigned party such as the Center for Natural Lands Management will accept oversight in a phased manner linked to the phased buildout of the project study area. Newhall, or a designee, shall install adequate signage and provide oversight to ensure the preserves are not inadvertently damaged.

Initial monitoring and reporting will be performed for 10 continuous years from the year of Section 2081 permit issuance. Monitoring and reporting may be extended if spineflower populations decline for 5 continuous years and/or the success criteria outlined herein are not met, as required by NRSP EIR Mitigation Measures 4.6-66 and 4.6-77 (County of Los Angeles 2003).

As described in *Section 10.1.4,* annual reports will be prepared and submitted to Newhall, the County, and CDFG by December 31 each year for 10 continuous years and/or until the success criteria outlined herein are met. One comprehensive report will be submitted for all the established spineflower preserve areas. *Section 10.1.4* lists the contents of the reports.

16.0 SCHEDULE

Table 21 shows a schedule for implementing this Plan, including establishment of the preserve areas, management activities for existing and proposed land uses, maintenance, monitoring, and reporting.

Table 21
Schedule for Monitoring and Management Responses

Activity	Frequency
Management Measures for Existing Agricultural Activities (Fall 2007 until Agricultural Activities Discontinued)	
Installation of signs (82 signs)	September 2007
Erosion control (silt fence 10,395 linear feet)	September 2007
Management Measures during Construction (Fall 2010 through Fall 2017)	
Installation of orange snow fencing (32,685 linear feet)	Prior to starting construction
Erosion control (silt fence 10,395 linear feet)	Prior to starting construction
Training construction personnel about the spineflower	Prior to starting construction
Construction monitoring	Prior to starting construction
General Management Measures for the Preserves (Spring 2010 through Spring 2060)	
Landscape Planting within Preserves	September 2010 through 2017

Table 21
Schedule for Monitoring and Management Responses

Activity	Frequency
Installation of signs (42 signs)	September 2010 through 2017
Installation of fencing (17,090 linear feet)	September 2010 through 2017
Spineflower seed collection and storage	Annually Beginning Spring 2010 for 10 years
Quantitative monitoring (177 acres at 20 acres per 10-hour day)	Annually Beginning Spring 2010
Qualitative monitoring (177 acres at 100 acres per 10-hour day)	Quarterly Beginning Spring 2010
Reporting (quarterly and annual)	Annually Beginning Spring 2010
Maintenance activities (repairing fencing, signage, etc.; weeding; trash removal)	Quarterly Beginning Spring 2010
Maintenance Measures (Spring 2010 through Spring 2060)	
Pest control	Annually Beginning Spring 2010
Weed control	Quarterly Beginning Spring 2010
Maintenance activities (repairing fencing, signage, etc.; trash removal)	Quarterly Beginning Spring 2010
Adaptive Management Measures (Spring 2010 through 2060)	
Pest control	Annually Beginning Winter 2010
Monitoring and removing trash	Quarterly Beginning Spring 2010
Reporting	Annually Beginning Winter 2010

NOTE: The timing of monitoring and management is subject to change dependent on the timing of development.

17.0 CONSERVATION AND TAKE ESTIMATES

This section quantifies and describes impacts to spineflower that are not avoided in the context of the development plans proposed for the project study area and documents the ways in which impacts have been avoided, minimized, and mitigated. As required by Fish and Game Code Section 2081(b)(2), this section provides information that CDFG will consider when determining whether impacts of the authorized take are minimized and fully mitigated and, therefore, result in "no jeopardy" to the spineflower species.

Since the spineflower was first discovered on Newhall Land in 2000, Newhall has conducted annual surveys to establish the distribution, aerial extent, and numbers of spineflower. Based on the survey results, Newhall has revised the site development plans of NRSP and Entrada to avoid and minimize impacts to spineflower. As a result of the development redesign, direct impacts to spineflower have been reduced from almost 100% of the known populations outside the two existing conservation easements to approximately 20% of the 20.2 acres of known spineflower occurrence on Newhall Land.

Avoidance of the spineflower and design of the preserves were based on a number of factors, including the distribution and abundance of the spineflower within the project study area, ecological indicators, and existing and proposed land uses. As described in *Section 7.0*, the

preserves incorporate a cross-section of the ecological indicators associated with the overall spineflower occurrences, including vegetation, soils, geology, elevation, slope, and aspect. *Tables 7A through 13B* in *Section 7.0* indicate that the various attributes of the six ecological indicators are represented in these preserves. In addition, the preserves contain areas of potentially suitable but unoccupied habitat that may accommodate fluctuations in the population numbers of the spineflower.

Four core occurrences (87% of individuals using 2003 occurrence data, 89% of individuals using 2005 occurrence data) within the NRSP are being preserved: San Martinez Grande, Potrero, Airport Mesa, and Grapevine Mesa. There are a number of occurrences that are not proposed for avoidance in this Plan because of their location and the difficulty associated with providing connectivity to those locations. These include occurrences adjacent to Airport Mesa, Grapevine Mesa, and Potrero.

At Entrada, approximately half of the 2003 spineflower and 40% of the 2005 spineflower will be conserved, although 315,017 individuals (27% of the known 2003 population and 42% of the known 2005 population at Entrada) and 0.16 acre of occupied habitat occur in or near an existing utility easement. Impacts were minimized by conserving the core area in the northeastern portion of the site.

At VCC, neither avoidance nor minimization are practicable in order to maintain the integrity of the approved development plan. The VCC project was approved for development of 12 million square feet of industrial buildings in 1990, half of which have been built. Spineflower observed at VCC accounted for approximately 3% of all spineflower observed at Newhall Land in both 2003 and 2005.

Tables 22 and *23* depict the proposed conservation and take of 2003 and 2005 spineflower individuals, and *Table 24* shows the take of acres based on the total footprint of spineflower occurrences associated with the three projects addressed in this Plan. The 2003 and 2005 occurrences were selected for analysis of significance because these years represent the greatest numbers of individuals observed and normal rainfall.

Table 22
Conservation and Take by Project Site Using 2003 Occurrence Data

Project Site	SFVS Individuals to Be Conserved	SFVS Individuals to Be Taken	Total
NRSP	4,017,600 (87%)	575,835 (13%)	4,593,435
VCC	0 (0%)	170,081 (100%)	170,081
Entrada	550,100 (46%)	633,404 (54%)	1,183,504
Total	**4,567,700 (77%)**	**1,379,320 (23%)**	**5,947,020**

Table 23
Conservation and Take by Project Site Using 2005 Occurrence Data

Project Site	SFVS Individuals to Be Conserved	SFVS Individuals to Be Taken	Total
NRSP	5,584,212 (89%)	666,228 (11%)	6,250,440
VCC	0 (0%)	223,155 (100%)	223,155
Entrada	301,653 (40%)	448,836 (60%)	750,489
Total	**5,885,865 (81%)**	**1,338,219 (19%)**	**7,224,084**

Table 24
Conservation and Take by Project Site Using Total Footprint

Project Site	SFVS Acres to be Conserved	SFVS Acres to be Taken	Total
NRSP	13.23 (68.4%)	6.12 (31.6%)	19.35
VCC	0.84 (0%)	0.84(100%)	0.84
Entrada	1.02 (51%)	0.98 (51.0%)	2.0
Total	**14.25 (64.2%)**	**7.94 (35.8%)**	**22.19**

Residual direct impacts that have not been avoided or minimized amount to 1,379,320 spineflower individuals (or 23%) for 2003 occurrences and 1,338,219 spineflower individuals (or 19%) for 2005 occurrences. These impacts will be mitigated by maintenance activities, monitoring, and adaptive management measures within the five preserve areas. These activities, as described above in *Sections 9.0, 10.0,* and *11.0*, are essential to achieving a primary goal of this Plan, which is to ensure the long-term persistence of spineflower in the project study area. Each preserve and buffer area will be placed into a permanent conservation easement to ensure long-term protection. The permanent conservation easements will contain appropriate

restrictions that will help ensure the property remains in a condition suitable for spineflower and its associated ecosystem components, in perpetuity. The CDFG will approve the conservation easement holder and approve the conservation easement language to ensure it is consistent with the CESA standards.

Permitting Process

Newhall will apply for a single Section 2081 incidental take permit for spineflower within the project study area covered by this Plan. The CDFG and ACOE are the lead agencies for the darft EIS/EIR (URS 2007) for the Resource Management and Development Plan project component and associated Section 404/Master 1600 permits/agreements. The Draft EIS/EIR will provide CEQA review for purposes of the Section 2081 permit for take of SFVS in the project study area. This Plan is intended to provide analysis of project and cumulative impacts to the spineflower, and it is anticipated that this Plan will be included as an appendix to the Draft EIS/EIR. In addition, this Plan will supplement Newhall's Section 2081 permit application and its CCA.

A CCA for spineflower was submitted to the USFWS Ventura Field Office on February 2, 2005. This Plan will be attached to the Final CCA as an appendix in order to demonstrate that threats to the spineflower will be reduced, such that spineflower need not be listed as endangered or threatened under FESA.

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APPENDICES

APPENDIX A

Plants Found at the Newhall Ranch Specific Plan Area
Buffer Zone Plant And Seed List

LEGEND:

*	Indicates typically planted from seeds
^	Indicates fast-germinating species useful as nurse crops/erosion control
wet	Indicates species appropriate to wetland areas only.

NOTES:

1. Native species may be added to this buffer area plant list if deemed appropriate by a qualified biologist in writing.
2. A qualified biologist shall design plant and seed palettes for buffer zone areas that are appropriate to the specific site and adjacent habitat.
3. This list is not designed for fuel modification zones or fuel management areas.

CONIFERAE

Juniperus californica – California juniper

AMARANTHACEAE – AMARANTH FAMILY

Amaranthus palmeri – Palmer's amaranth*
Amaranthus powellii – Powell's amaranth*

ANACARDIACEAE – SUMAC FAMILY

Malosma laurina – laurel sumac
Rhus ovata – sugar-bush
Rhus trilobata – squaw bush
Toxicodendron diversilobum – poison-oak

ASTERACEAE – SUNFLOWER FAMILY

Ambrosia acanthicarpa – annual burweed*
Ambrosia confertifolia – weak-leaved burweed*^
Ambrosia psilostachya – western ragweed*
Artemisia californica – California sagebrush
Artemisia douglasiana – California mugwort*
Artemisia dracunculus – tarragon*
Artemisia tridentata – Great Basin sagebrush
Baccharis douglasii – marsh baccharis

Baccharis emoryi – Emory's baccharis
Baccharis pilularis – coyote brush
Baccharis salicifolia – mulefat
Baccharis sarothroides – chaparral broom
Brickellia californica – California brickellbush
Brickellia nevinii – Nevin's brickellbush
Chrysothamnus nauseosus – rubber rabbitbrush
Corethrogyne filaginifolia – virgate cudweed aster*
Encelia actoni – Acton's encelia
Encelia californica – California bush sunflower*
Encelia farinosa – brittlebush, incensio
Ericameria palmeri var. *pachylepis* – goldenbush
Ericameria pinifolia – pine-bush
Erigeron foliosus – leafy daisy
Eriophyllum confertiflorum – long-stem golden yarrow*
Gnaphalium bicolor – bicolor cudweed*^
Gnaphalium californicum – California everlasting*^
Gnaphalium canescens ssp. *microcephalum* – white everlasting*^
Gnaphalium luteo-album – white cudweed*^
Gnaphalium palustre – lowland cudweed*^
Hazardia squarrosa ssp. *grindelioides* – saw-toothed goldenbush
Helianthus annuus – common sunflower
Helianthus nuttallii c.f. ssp. *parishii* – Los Angeles sunflower
Hemizonia fasciculata – fascicled tarweed*^
Isocoma menziesii – goldenbush
Iva axillaris – poverty weed
Lasthenia californica – coast goldfields*^
Lepidospartum squamatum – scale-broom
Lessingia filaginifolia – California aster*
Lessingia glandulifera – lessingia*
Pluchea odorata – marsh-fleabane*^[wet]
Pluchea sericea – arrow weed[wet]

BORAGINACEAE – BORAGE FAMILY

Amsinckia menziesii var. *intermedia* – yellow fiddleneck*
Amsinckia menziesii var. *menziesii* – yellow fiddleneck*

Cryptantha intermedia – common forget-me-not*
Cryptantha micrantha – redroot cryptantha*
Cryptantha Microstachys – Tejon cryptantha*
Cryptantha Muricata – prickly cryptantha*
Plagiobothrys canescens – rusty popcorn flower*
Plagiobothrys collinus – California popcorn flower*

CACTACEAE – CACTUS FAMILY

Opuntia californica var. *parkeri* – cane cholla
Opuntia littoralis – coastal prickly-pear
Opuntia X vaseyi – prickly-pear cactus

CAPPARACEAE – CAPER FAMILY

Isomeris arborea – bladderpod

CAPRIFOLIACEAE – HONEYSUCKLE FAMILY

Lonicera subspicata – southern honeysuckle
Sambucus mexicana – Mexican elderberry
Symphoricarpos c.f. mollis – spreading snowberry

CHENOPODIACEAE – GOOSEFOOT FAMILY

Atriplex canescens – four-winged saltbush
Atriplex lentiformis– big saltbush, quail brush

EUPHORBIACEAE – SPURGE FAMILY

Croton californicus – California croton

FABACEAE – PEA FAMILY

Astragalus didymocarpus – white dwarf locoweed
Astragalus gambelianus – Gambel's locoweed
Astragalus trichopodus – Santa Barbara locoweed
Lotus scoparius var. *scoparius* – deerweed*
Lupinus bicolor – Lindley's annual lupine*^
Lupinus excubitus – mountain springs bush lupine*
Lupinus excubitus var. *hallii* – grape soda lupine*
Lupinus hirsutissimus – stinging lupine*

Lupinus microcarpus var. *densiflorus* – chick lupine*
Lupinus microcarpus var. *microcarpus* – chick lupine*
Lupinus sparsiflorus – Coulter's lupine*
Lupinus succulentis – arroyo lupine*^
Lupinus truncatus – collar lupine*

FAGACEAE – BEECH FAMILY

Quercus agrifolia – coast live oak
Quercus berberidifolia – scrub oak
Quercus douglasii – blue oak
Quercus lobata – valley oak

GROSSULARIACEAE – CURRANT FAMILY

Ribes aureum – golden currant
Ribes malvaceum – chaparral currant

HYDROPHYLLACEAE – WATERLEAF FAMILY

Eriodictyon crassifolium var. *nigrescens* – yerba santa*
Nemophila menziesii – baby blue-eyes*^
Nemophila parviflora var. *quercifolia* – oak-leaved nemophila*^
Phacelia cicutaria – caterpillar phacelia*^
Phacelia cicutaria var. *hispida* – caterpillar phacelia*^
Phacelia distans – blue fiddleneck*
Phacelia imbricata ssp. *imbricata* – imbricate phacelia*^
Phacelia minor – wild canterbury–bell*^
Phacelia ramosissima – shrubby phacelia*

JUGLANDACEAE – WALNUT FAMILY

Juglans californica – Southern California black walnut

LAMIACEAE – MINT FAMILY

Salvia apiana – white sage
Salvia columbariae – chia
Salvia leucophylla – purple sage
Salvia mellifera – black sage

APPENDIX A

Plants Found at the Newhall Ranch Specific Plan Area Buffer Zone Plant And Seed List

LAURACEAE – LAUREL FAMILY

Umbellularia californica – California laurel

LOASACEAE – STICK-LEAF FAMILY

Mentzelia sp. – blazing star*
Mentzelia laevicaulis – blazing star*
Mentzelia micrantha – small-flowered stick-leaf*

MALVACEAE – MALLOW FAMILY

Malacothamnus fasciculatus ssp. *laxiflorus* – chaparral bush mallow
Malacothamnus fremontii – bush mallow
Malacothamnus marrubioides – bush mallow

NYCTAGINACEAE – FOUR O'CLOCK FAMILY

Mirabilis laevis var. *crassifolia* [*M. californica*] – California wishbone-bush

OLEACEAE – OLIVE FAMILY

Fraxinus dipetala – California ash

ONAGRACEAE – EVENING-PRIMROSE FAMILY

Camissonia bistorta – southern sun cup*
Camissonia boothii – sun cup*
Camissonia boothii ssp. *decorticans* – shredding evening primrose*
Camissonia californica – mustard primrose*
Camissonia hirtella – sun cup*
Camissonia strigulosa – sun cup*
Clarkia purpurea – winecup clarkia*^
Clarkia speciosa – clarkia*^
Clarkia unguiculata – elegant clarkia*^
Epilobium brachycarpum – willow herb
Epilobium canum ssp. *canum* – California fuchsia
Epilobium ciliatum – California cottonweed
Oenothera elata – evening primrose*^ (use carefully aggressive native in wet areas)

PAPAVERACEAE – POPPY FAMILY

Argemone corymbosa – prickly poppy*

Eschscholzia californica – California poppy*^
Platystemon californicus – California creamcups*

PLANTAGINACEAE – PLANTAIN FAMILY
Plantago erecta – dot-seed plantain*^

PLATANACEAE – SYCAMORE FAMILY
Platanus racemosa – western sycamore

POLEMONIACEAE – PHLOX FAMILY
Eriastrum sapphirinum – sapphire eriastrum
Gilia capitata – globe gilia*
Leptodactylon californicum – prickly phlox

POLYGONACEAE – BUCKWHEAT FAMILY
Eriogonum angulosum – angle-stem buckwheat
Eriogonum baileyi – Bailey's buckwheat
Eriogonum brachyanthum – short-flowered buckwheat
Eriogonum elongatum – long-stemmed buckwheat
Eriogonum fasciculatum ssp. *foliolosum* – California buckwheat
Eriogonum fasciculatum ssp. *polifolium* – California buckwheat
Eriogonum gracile var. gracile – slender woolly buckwheat
Eriogonum gracillimum – rose and white buckwheat
Eriogonum maculatum – spotted buckwheat
Eriogonum c.f. viridescens – buckwheat

RANUNUCULACEAE – BUTTERCUP FAMILY
Delphinium parryi ssp. *parryi* – Parry's larkspur*

RHAMNACEAE – BUCKTHORN FAMILY
Ceanothus crassifolius – hoary-leaved ceanothus
Ceanothus tomentosus – woolyleaf ceanothus
Rhamnus crocea – redberry
Rhamnus ilicifolia – holly-leaf redberry

APPENDIX A

Plants Found at the Newhall Ranch Specific Plan Area
Buffer Zone Plant And Seed List

ROSACEAE – ROSE FAMILY

Adenostoma fasciculatum – chamise (use sparingly)
Cercocarpus betuloides – mountain-mahogany
Cercocarpus betuloides var. *betuloides* – birch-leaf mountain-mahogany
Cercocarpus betuloides var. *blancheae* – island mountain-mahogany
Heteromeles arbutifolia – toyon
Prunus ilicifolia – holly-leaf cherry
Rosa californica – California rose[wet]
Rubus ursinus – California blackberry[wet]

SALICACEAE – WILLOW FAMILY

Populus fremontii – Fremont's cottonwood[wet]
Salix exigua – narrow-leaved willow[wet]
Salix gooddingii – black willow[wet]
Salix laevigata – red willow[wet]
Salix lasiolepis – arroyo willow[wet]
Salix lucida ssp. *lasiandra* – golden willow[wet]

SAURURACEAE – LIZARD'S-TAIL FAMILY

Anemopsis californica – yerba mansa[wet]

SCROPHULARIACEAE – FIGWORT FAMILY

Antirrhinum coulterianum – white snapdragon
Antirrhinum multiflorum – withered snapdragon
Castilleja affinis – coast paintbrush*
Castilleja densiflora – dense-flowered owl's-clover*
Castilleja exserta – common owl's-clover*
Castilleja foliolosa – woolly Indian paintbrush*
Collinsia heterophylla – purple Chinese houses
Cordylanthus rigidus – bird’s beak
Keckiella cordifolia – heart-leaf penstemon
Mimulus aurantiacus – bush monkeyflower
Mimulus aurantiacus var. *pubescens* – bush monkeyflower
Mimulus guttatus – seep monkeyflower[wet]
Mimulus pilosus – downy monkeyflower
Penstemon centranthifolius – scarlet bugler

APPENDIX A

Plants Found at the Newhall Ranch Specific Plan Area Buffer Zone Plant And Seed List

SOLANACEAE – NIGHTSHADE FAMILY

Solanum douglasii – white nightshade
Solanum xanti – chaparral nightshade

URTICACEAE – NETTLE FAMILY

Urtica dioica – giant creek nettle[wet]

VERBENACEAE – VERVAIN FAMILY

Verbena lasiostachys – western verbena

VITACEAE – GRAPE FAMILY

Vitis girdiana – desert wild grape[wet]

ANGIOSPERMAE (MONOCOTYLEDONES)

CYPERACEAE – SEDGE FAMILY

Carex alma – sturdy sedge[wet]
Cyperus eragrostis – tall cyperus[wet]
Cyperus esculentus – yellow nut-grass[wet]
Cyperus odoratus – coarse cyperus[wet]
Eleocharis montevidensis – slender creeping spike-rush[wet]
Eleocharis parishii – Parish's spikerush[wet]
Eleocharis rostellata – beaked spikerush[wet]
Scirpus acutus – hard-stemmed bulrush[wet]
Scirpus americanus – winged three-square[wet]
Scirpus maritimus – alkali bulrush[wet]
Scirpus microcarpus – bulrush[wet]
Scirpus robustus – Pacific coast bulrush[wet]

JUNCACEAE – RUSH FAMILY

Juncus acutus ssp. *leopoldii* – southwestern spiny rush[wet]
Juncus balticus – wire rush[wet]
Juncus bufonius – toad rush
Juncus longistylis – rush
Juncus mexicanus – Mexican rush[wet]
Juncus rugulosus – wrinkled rush

Juncus torreyi – rush
Juncus triformis – Yosemite dwarf rush
Juncus xiphioides – iris-leaved rush[wet]

LILIACEAE – LILY FAMILY

Bloomeria crocea – common goldenstar
Yucca whipplei – Our Lord's candle

POACEAE – GRASS FAMILY

Achnatherum coronatum – giant needlegrass*
Bromus catharticus – California brome*
Bromus catharticus var. *catharticus* – California brome*^
Distichlis spicata – salt grass[wet]
Elymus glaucus – western wild-rye
Elymus multisetus – big squirreltail
Leymus condensatus – giant ryegrass
Leymus triticoides – beardless wild rye[wet]
Melica imperfecta – California melic
Muhlenbergia asperifolia – scratch-grass
Muhlenbergia microsperma – littleseed muhly
Nassella cernua – nodding needlegrass
Nassella lepida – foothill needlegrass
Nassella pulchra – purple needlegrass
Vulpia microstachys – fescue*^
Vulpia octoflora – six-weeks fescue*^

TYPHACEAE – CATTAIL FAMILY

Typha domingensis – slender cattail[wet]
Typha latifolia – broad-leaved cattail[wet]

APPENDIX B

List of Invasive Ornamental Plants

(Prohibited in landscape areas adjacent to Preserves)

BOTANICAL NAME	COMMON NAME
Acacia latifolia	Sydney golden wattle
Achillea millefolium var. *millefolium*	common yarrow
Ailanthus altissima	tree of heaven
Aptenia cordifolia	red apple
Arctotheca calendula	cape weed
Arctotis spp. (all species & hybrids)	African daisy
Arundo (all species & hybrids)	giant reed or arundo grass
Atriplex semibaccata	Australian saltbush
Carex spp. (all species)	sedge
Carpobrotus chilensis	ice plant
Carpobrotus edulis	sea fig
Centranthus ruber	red valerian
Chrysanthemum coronarium	annual chrysanthemum
Cistus ladanifer (incl. hybrids/varieties)	gum rockrose
*Cortaderia jubata [*syn.*C. Atacamensis]*	jubata grass, pampas grass
*Cortaderia dioica [*syn. *C. sellowana]*	pampas grass
Cynodon dactylon	Bermuda grass
Cyperus spp. (all species)	nutsedge, umbrella plant
Cytisus spp. (all species)	broom
Dimorphotheca spp. (all species)	African daisy, Cape marigold
Drosanthemum floribundum	rosea ice plant
Drosanthemum hispidum	purple ice plant
Eichhornia crassipes	water hyacinth
Elaegnus angustifolia	Russian olive
Eucalyptus globulus	blue gum tree
Festuca rubra	creeping red fescue
Foeniculum vulgare	sweet fennel
Fraxinus uhdei	(and cultivars) evergreen ash, shamel ash
Gaura spp. (all species)	gaura
Genista spp. (all species)	broom
Hedera canariensis	Algerian ivy
Hedera helix	English ivy
Hypericum spp. (all species)	St. John's wort

APPENDIX B

List of Invasive Ornamental Plants

(Prohibited in landscape areas adjacent to Preserves)

BOTANICAL NAME	COMMON NAME
Limonium perezii	sea lavender (Invades wetlands)
Linaria bipartita	toadflax
Lolium multiflorum	Italian ryegrass
Lollium perenne	perennial ryegrass
Lonicera japonica (incl. 'Halliana')	Japanese honeysuckle
Lupinus arboreus	yellow bush lupine
Lupinus texanus	Texas blue bonnets
Mesembryanthemum nodiflorum	little ice plant
Myoporum laetum	myoporum
Oenothera berlandieri	Mexican evening primrose
Olea europea	European olive tree
Opuntia ficus-indica	Indian fig
Pennisetum setaceum	fountain grass
Phoenix canariensis	Canary Island date palm
Phoenix dactylifera	date palm
Plumbago auriculata	cape plumbago
Polygonum spp. (all species)	knotweed
Populus nigra 'italica'	Lombardy poplar
Prosopis spp. (all species)	mesquite
Ricinus communis	castorbean
Robinia pseudoacacia	black locust
Rubus procerus	Himalayan blackberry
Sapium sebiferum	Chinese tallow tree
Saponaria officinalis	bouncing bet, soapwart
Schinus molle	Peruvian pepper tree, a.k.a. California pepper
Schinus terebinthifolius	Brazilian pepper tree
Spartium junceum	Spanish broom
Tamarix spp. (all species)	tamarisk, salt cedar
Trifolium tragiferum	strawberry clover
Tropaelolum majus	garden nasturtium
Ulex europaeus	prickly broom
Vinca major	periwinkle
Yucca gloriosa	Spanish dagger

APPENDIX B

List of Invasive Ornamental Plants

(Prohibited in landscape areas adjacent to Preserves)

Sources: Hickman 1993.

APPENDIX C

DRAFT
RELATIONSHIP OF ARGENTINE ANT TO CONSERVED SAN FERNANDO VALLEY SPINEFLOWER POPULATIONS

Section 1. Introduction and Background

The purpose of this paper is to address the potential impact and management of the invasive, non-native Argentine ant (*Linepithema humile*) on the Newhall Ranch San Fernando Valley spineflower preserve areas and the ways in which these impacts can be avoided, minimized and mitigated. A Spineflower Conservation Plan (SCP) (Dudek June 2007) has been prepared that describes the conservation and management framework to permanently protect and manage a system of preserves designed to maximize the long-term persistence of the state-listed endangered San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*; spineflower) within the project study area described below. The May 2007 SCP addresses issues that will be important for controlling the Argentine ant in the spineflower preserves such as buffer zones, edge conditions, project design features and management of hydrology within preserve areas. In response to questions raised by the California Department of Fish and Game (CDFG) who will be issuing a California Endangered Species Act Section 2081(b) incidental take permit for the spineflower, this paper is intended to expand on the issues of controlling Argentine ants in the preserves that were not explicitly addressed in the SCP.

Section 2. Argentine Ant Biology and General Characteristics

Argentine ants are native to sub-tropical and mild-temperature portions of Argentina (Holway et al. 2002a). They are small bodied, about one sixteenth of an inch long, and are dark-brown to black in color. They are very social and in California they are thought to live in large "supercolonies" that function as one interdependent group – termed "unicolonial" – that do not have distinct behavioral boundaries among separate nests (Holway et al. 2002a). These supercolonies can consist of hundreds to thousands of members. These ants have more than one queen per colony (i.e., polygynous), typically with about eight queens for every 1,000 workers (Insecta Inspecta World Argentine Ants 2007). New colonies form from old ones when a queen leaves with a band of workers to start a new one in a process termed "budding." Holway et al. (2002a) note that invasive ants in general tend to be unicolonial and suggest that this pattern allows the colonies to become quite large and dominate invaded habitats.

Argentine ants are omnivores, meaning that they are dietary opportunists and generalists and eat both plant and animal matter, including seeds. This also appears to be characteristic of invasive ant species in general (Holway et al. 2002a). Argentine ants, also known as "sugar ants," have a strong preference for sweet substances.

Argentine ants usually occupy the top six feet of soil. They prefer moist soil underneath buildings and sidewalks. As discussed in more detail below, Menke and Holway (2006) experimentally demonstrated with drip irrigation that Argentine ants both increase in abundance and invade native ant communities with elevated soil moisture and plant cover and that their abundance decreases with cessation of irrigation. Food sources and temperature dictate where they create their nests.

Argentine ants were originally introduced to North America via coffee and sugar shipments to New Orleans from South America about 1890. They have spread to several continents and smaller land bodies around the world, including Subsaharan Africa, Atlantic Ocean islands, Asia, Australia, the Mediterranean, North America, and Pacific Ocean islands (Holway et al. 2002a). In North America, they have spread to the east from the Carolinas south to Florida and west through Texas to California (Insecta Inspecta World Argentine Ants 2007). They are thought to have first spread into southern California near Ontario in San Bernardino County and spread rapidly throughout citrus groves (Suarez et al. 1998). They are widespread in mild-temperature, Mediterranean ecosystems, but do not invade tropical and cold-temperature areas (Holway et al. 2002a), possibly because they have relatively narrow thermal tolerances. Holway et al. (2002b) exposed Argentine ants and six native ant species to high temperatures and found that Argentine ants has the lowest tolerance for high temperatures, with 100% of field collected workers dying after 60 minutes exposure to temperatures $\geq 46^{o}$ Centigrade ($\geq 114.8^{o}$ Fahrenheit). Similarly, Argentine ants were less tolerant of low soil moisture conditions in a laboratory setting. Generally, Argentine ants foraged more actively and had less mortality under warm and humid conditions compared to hot and dry conditions (Holway et al. 2002b).

Dispersal by Argentine ants occurs by budding as opposed to winged dispersal of females. This budding limits the rate at which Argentine ants can disperse. Based on a compilation of several studies, Suarez et al. (2001) reported that Argentine ants in northern California disperse at a rate of about 15-270 meters/year and suggest that budding depends on "human-mediated dispersal to colonize new and distant locations." Invasion of new areas thus occurs at the point of introduction or at points adjacent to source populations. For example, infested landscape plants translocated to a new development could be a source of introduction that spreads to suitable habitat contiguous with the point of introduction if the adjacent habitat has suitable habitat conditions (i.e., high moisture levels). The likelihood that Argentine ants disperse also relates to nesting behavior where colonies may relocate nests in response to changes in the physical environment or changes in food sources (Holway et al. 2002a). Also, Argentine ants have the ability to disperse by "rafting" along water courses, including urban runoff, making them highly adaptive to dispersing in urban environments (Holway et al. 2002a).

Recent studies have demonstrated that the invasive population of Argentine ants in California functions as single large supercolony, based on population genetics and colony structure (Tsutsui et al. 2003). Population samples in California compared to native populations in Argentina showed reduced genetic variability in the non-native California population compared to the native population, along with reduced intraspecific (within species) aggression among different colonies. This supercolony structure, and related lack of aggression between different nests, may have important ramifications for long-term management of this species because it is thought to be one of the factors that makes the Argentine ant such a successful colonizer.

Section 3. Impacts on Native Species and Habitats

Invasive ants, including Argentine ants, may significantly disrupt the natural ecosystems within their introduced range. Argentine ants may become abundant within their introduced range and may drive out or kill native ants of a newly invaded territory (Holway et al. 2002a; Suarez et al. 1998). This displacement of native ants is the most obvious and widely-reported effect of non-native ants and may cause as high as 90% or more reduction of native ant abundance (Holway et al. 2002a). The displaced ants often are ecologically similar to the invasive ants (i.e., occupy similar ecological niches, use same food resources, etc.), but displaced ants may also be ecologically different (e.g., use different food sources), such as harvester ant species that are displaced by Argentine ants in California (Holway et al. 2002a). Cold- and heat-tolerant native ants may better co-exist with Argentine ants in California because the Argentine ant cannot as effectively invade their habitats due to their limited thermal tolerances and requirement of moist, mild conditions.

The impact of Argentine ants on native fauna may be mediated through killing or displacing prey of higher trophic species. In southern California, for example, this has greatly reduced the numbers of the coastal horned lizard (*Phrysonoma coronatum*) which predominately feeds on native harvester ants (Suarez and Case 2002).

The mechanisms of displacement of native ants by non-native ants is not well understood, but appear to be some combined effect of “interference” and “exploitative competition” (Holway et al. 2002a).

Interference by invasive ants refers to worker-level behaviors such as physical aggression and use of chemical defensive compounds, and colony-level behaviors such as recruitment of nestmates, interspecific (between species) territoriality, and nest raiding (Holway et al. 2002a). The sheer size of the invading and supercolonies relative to native ant populations is an important factor contributing to interference. Interference behavior of Argentine ants in particular includes chemical defensive compounds, physical aggression by workers, workers

preying on the winged queens of native species, remaining at baits longer than native species, recruiting to baits in higher numbers than native species, recruiting to more baits than native species, discovering and recruiting to baits more quickly than native species, displacing native ants from baits, adjusting foraging behavior to local worker density, and remaining active both day and night and throughout the year (Holway et al. 2002a).

Exploitative competition is an indirect form of competition that nonetheless can have severe impacts on native species. Supercolonies have superior work forces with more "scouts" looking for food and "recruits" from the nest who help with exploiting discovered food sources. This force of numbers allows Argentine ants to discover food and exploit food sources more quickly than native ants (Holway et al. 2002a). Holway et al. (2002a) suggest that exploitative competition may be relatively more important for colonizing new areas, such as "at the leading edge of an invasion front."

The impact of Argentine ants on native ants can have a cascading effect throughout the ecosystem because of the ecological role filled by displaced native ants, but also through direct impacts on other taxa (Holway et al. 2002a). The known ecological effects of Argentine ants in California on non-ant species through competition and predation identified by Holway et al. (2002a) include:

- Predation on invertebrates, including eggs, larvae and certain adult forms.
- Cause of California gnatcatcher nest failure
- Displacement of harvester ant prey of coast horned lizard
- Lower growth rate of coast horned lizard feeding on Argentine ants
- Lack of overlap between Argentine ants and coast horned lizard (presumably due to impact on harvester ants)
- Negative relationship between Argentine ant density and gray shrew (*Notiosorex crawfordi*) captures
- Negative relationship, absence or reduced abundance of Collembola (springtails), flies, spiders, beetles, longhorn beetle, yellowjackets (attacks colonies), mealybug and walnut aphid.

Of particular interest in this analysis of the Argentine ant is its potential impact on the San Fernando Valley spineflower. Ant-plant "mutulisms" or relationships include tending, seed dispersal and interactions with flowers (Holway et al. 2002a). If native ants that carry out these functions are replaced by non-native ants that may or may not fulfill any or all of these functions, the reproductive cycle of the plant may be disrupted.

Generally ants are considered to be poor pollinators. Argentine ants that are attracted to floral nectars may be exploiting the nectar resource more effectively than native non-ant pollinators or directly displacing the native pollinators. Either way, the presence of Argentine ants may be detrimental to the plant. There is some evidence that Argentine ants are associated with declines in seed set, but the data are equivocal (Holway et al. 2002a).

Ants may be involved in seed dispersal from the parent plant. Some evidence indicates that a native harvester ant (*Messor andrei*) plays a role in dispersal of San Fernando Valley spineflower. LaPierre and Wright (2000) observed harvester ants carrying spineflower flower parts containing seeds to nest sites and spineflower parts were evident in harvest ant midden piles. Harvester ants are capable of foraging for seeds as far as 330 feet from the nest and thus seeds may be dropped along the way. Although there is no direct evidence that Argentine ants impact potential *M. andrei* spineflower seed dispersal, their documented displacement of native harvester ants indicates a strong potential for disruption of seed dispersal to occur. Moreover, in South Africa Argentine ants displace native ants that are seed dispersers, but they themselves are poor seed dispersers in that they fail to disperse or bury seeds. They consume the seed's elaisome (fleshy skin) and leave the seed aboveground where it is susceptible to rodent predation and fire (Holway et al. 2002a).

Although little is known of the reproductive biology of the San Fernando Valley spineflower, Glenn Lukos Associates biologists noted that ants (mostly of the *Dorymyrex insanus* complex) were the most frequent flower visitors on the spineflower populations on Ahmanson Ranch (cited by the Conservation Biology Institute [CBI 2000]). CBI's personal communications with botanists Dr. James Reveal and Dr. Eugene Jones indicate that ants may play a role in spineflower pollination. Reveal observed other spineflower species being pollinated by ants, but that such pollination was "incidental (secondary)" rather than primary. Jones "observed high densities of ants in and out of spineflower corollas in the field and suggests that ants may play an important role in pollination of this species" (CBI 2000, p. 3). Based on these observations, it should be assumed for the purpose of spineflower preserve design and management, that invasions of Argentine ants would be detrimental to spineflower plants.

Unchecked and under suitable conditions, Argentine ants may penetrate several hundred meters into native habitats in California. Suarez et al. (1998) investigated the penetration of Argentine

ants into fragmented patches of coastal sage scrub in the San Diego region of southern California. All of the sample locations were within about 10-11 miles of the coast and thus experience a fairly strong coastal influence throughout the year, including overcast conditions in the late spring and early summer months. They report that Argentine ants have penetrated several hundred meters into native habitats. For example, they state that "At the University of California's Elliot Reserve, Argentine ants have penetrated over 400 m into the reserve, and at Torrey Pines State Park Argentine ants have penetrated over 1 km into the park (J. King, unpublished data), both areas with predominantly native vegetation." (p. 2053). However, Suarez et al. also say that the amount of penetration is correlated with human-mediated disturbances such as the presence of exotic vegetation, changes in soil conditions and increases in moisture. A complicating factor is that the amount of penetration is site-specific, likely resulting from some interaction among these factors. For example, a canyon receiving runoff from adjacent development (either through natural or artificial drainage), resulting in newly created high moisture conditions, may be vulnerable to invasion and create a point of penetration into surrounding habitat.

Suarez et al. (1998) also provide some systematic data for Argentine ant penetration along urban edges. All traps within 300 feet of urban edges in San Diego canyons showed high levels of Argentine ants, whereas traps greater than 300 feet showed lower levels.

Understanding the mechanisms that create suitable habitat conditions for Argentine ants is critical for controlling invasions. Menke and Holway (2006) conducted field experiments to examine the direct effect of increased moisture through drip irrigation and the associated indirect effect of increased plant cover in irrigated areas on the abundance of Argentine ants and their displacement of native ant species. Irrigated plots had soil moistures ranging from 50% to 80% saturation depending on time since last watering while the non-irrigated control transects has soil moistures of less than 5% saturation.[1] By artificially elevating moisture and manipulating plant cover (by suppressing plant cover in irrigated plots, they demonstrated that increased moisture resulted in a greater abundance of Argentine ants and increased their ability to invade native plant communities. Although increased moisture alone caused increases in Argentine ants, the associated increase in plants increased abundance by 38% over plots where plant growth was suppressed, suggesting that fine-scale variation of the physical environment is a important factor in the susceptibility of an area to Argentine ant invasion. Menke and Holway (2006) suggested that the increased abundance on plots with plants may be related to presence of aphids. Generally they concluded that the increased abundance in irrigated plots was probably due to the "combined result of colony reproduction by budding, nest relocation and enhanced colony productivity." (p. 373). Also, Menke and Holway concluded that the increased abundance, even

[1] Soil measurements were obtained using an Aquaterr EC-2000® soil probe that estimates the percentage of saturation of the to 10 cm (3.9 in) of soil.

when plant growth was suppressed, was directly due to increased moisture because there was no indication that ants were attracted to food resources on the irrigated plots.

Section 3. Preserve Design

Based on the foregoing review, and particularly information regarding Argentine ant penetration into native habitats in fragmented canyon areas in southern California, this section analyzes the risk of Argentine ant invasion of the Newhall spineflower preserve areas.

One factor for whether increased moisture could be an attractant to Argentine ants in the spineflower preserve is the aspect of the conserved spineflower populations. According to the SCP, in the 2003 and 2005 surveys, spineflower populations tended to be concentrated in the west, southwest, southeast, east and northwest aspects. The flat, northeast and north aspects consistently had the lowest percentages of spineflower populations. The spineflower preserves generally conserve the aspects that have the greatest natural concentrations of spineflower. These aspects are also those that would have the most xeric natural conditions resulting from greater solar and wind exposure and, thus, less likely to support moist conditions conducive to invasion by Argentine ants. Also, the spineflower preserves are about 25 to 30 miles from the coast and experience hotter and drier summers than the coastal areas of San Diego (i.e., within 10 to 11 miles of the coast) where Suarez et al. (1998) observed ants in all sampled areas. It is possible that the spineflower preserves in the more inland area of Santa Clarita would be less susceptible to Argentine ant invasion, all things being equal, than native habitats in coastal San Diego County, although this hypothesis would need to be tested.

The Draft SCP analyzed the amount of buffer between the urban edge and spineflower populations within each of the preserve areas. The buffers between spineflower populations and urban development are required by the Specific Plan to be at least 80 feet, and in most cases the buffer is much greater than 80 feet. In order to control Argentine ant invasions, this minimum 80-foot buffer will need to remain a “dry zone” where typical (i.e., non-rainy season) soil moistures are maintained below 10%. Even though a few Argentine ants (scouts) may occur in this dry zone looking for suitable foraging and nesting resources, if this zone can be maintained as a dry, xeric area, the chance of colonization will be greatly reduced.

These preserve buffer zones will also be adjacent to fuel modification zones (FMZ) that will provide additional separation from the edge of urban development. Although FMZs are for the protection of public safety and property and not for management of the spineflower preserves, some general principles can help provide additional protection again invasions between the edge of urban development and spineflower populations. The foremost principle is to use native or non-invasive non-native drought-resistant plants in the FMZ to the extent possible to minimize

the amount of irrigation required to maintain the vegetation – irrigated zones should be eliminated to the extent possible, and particularly in the area adjoining the spineflower preserves. Soil disturbances in the FMZ should be avoided and minimized to reduce the chance of erosion, disturbance of cryptobiotic soils, and impacts to native species because Argentine ants also appear to be attracted to disturbed areas (Suarez et al. 1998).

The following section discusses project design features, mitigation and management measures for preserve areas that will further reduce the risk of Argentine ant invasions into the spineflower preserves.

Section 4. Project Design Features, Mitigation and Management Measures for ` Preserve Areas

Controls on Argentine ants will likely need to employ a combination of methods. The primary method is to maintain an inhospitable habitat condition between development and the spineflower preserve. This species is sensitive to moisture gradients and are more likely to invade mesic areas and avoid xeric areas. Menke and Holway (2006) noted that their abundance changes dramatically across soil moisture gradients and they suggest that interception and diversion of urban run-off from naturally xeric areas could restrict invasions by Argentine ants and that "even small reductions in urban run-off may act to limit *L. humile* in areas that are otherwise too dry" (p. 374). Thus a "dry zone" between urban and natural habitats where there is naturally little moisture may act a barrier for the ants and inhibit them from invading the natural areas.

Therefore, the focus of the Argentine ant control approach will be to implement measures that minimize the likelihood of Argentine ants establishing colonies at the interface between preserve and development areas and expanding into the preserve. Several project design features, mitigation and management measures described in the SCP will help prevent invasions of the Argentine ant into the spineflower preserves. Additional control measures beyond those specifically discussed in the SCP also are discussed in this section.

Project Design Features

First, to minimize initial establishment of Argentine ants adjacent to preserves container plants to be installed within 200 feet of the preserves shall be inspected for pests, including the Argentine ant, and any plants found to be infested shall be rejected. The CBI (2000) study suggests that this measure will be moderately effective for buffer widths of 80 to 100 feet and highly effective at buffers greater than 200 feet.

Second, project-specific design measures will be implemented in order to minimize changes in surface water flows to the spineflower preserve areas. These measures are intended to maintain the existing hydrology of the preserves and prevent unnatural increases in moisture within the preserves. As described above, increased soil moisture is the primary cause of Argentine ant invasions into natural habitats. Roadways will be constructed with slopes that convey water flows within the roadway easements and away from spineflower preserve areas. French drains will be installed along the edge of any roadways and fill slopes that drain toward the preserve areas. The CBI (2000) study suggests that french drains should be highly effective for buffers as small as 15 feet in width. Underground utilities will not be located within or through the preserve areas. Drainage pipes installed within the preserve areas away from spineflower populations to convey surface or subsurface water away from the populations will be aligned to avoid the preserve areas to the maximum extent practicable. Fencing or other structural type barriers that will be installed to reduce intrusion of people or domestic animals into the preserve areas shall incorporate footing designs that minimize moisture collection.

Storm drain outfalls from proposed development areas will only be installed within preserve areas where necessary to retain hydrologic conditions within the preserves, sustain existing riparian and wetland habitats, and/or allow for the restoration of currently disturbed areas to native riparian/alluvial habitat. It is important that no new wetlands or riparian areas are inadvertently created in proximity to spineflower populations.

When located in a preserve area, storm drains must meet the following criteria:

(1) Storm drains must not impact spineflower either directly or indirectly, based upon specific evaluations and a determination by CDFG;

(2) Storm drains may only daylight at the bottom of slopes within preserve areas; and

(3) Under no circumstances shall storm drains daylight onto steeply sloped areas or other areas that would cause erosion.

Any surface water entering a preserve area from development areas is required to pass through BMP measures, in accordance with the requirements of the County and Regional Water Quality Control Board (RWQCB), which will be described in the SWPPP. Storm drain outlets must contain adequate energy dissipaters to prevent downstream erosion and stream channel down-cutting, in accordance with the County and RWQCB requirements.

In addition, storm drain outlets must be designed based on pre- and post-construction hydrologic studies (in accordance with NRSP EIR Mitigation Measure 4.6-69 [County of Los Angeles

2003]). Storm drains and BMP measures shall be designed by a qualified licensed civil engineer, with design reviews by the consulting biologists, the County, and CDFG. Long-term maintenance of storm drain BMPs will be the responsibility of a County Landscape Maintenance District or other entity responsible for BMP maintenance.

General Monitoring and Management

Although the project design features described above will help control Argentine ant invasion into the spineflower preserves, there is still a potential for invasions to occur where typical soil moisture increases above about 10% saturation. Fortunately, invasions by Argentine ants, if they occur, are reversible under appropriate conditions. Menke and Holway (2006) demonstrated that Argentine ant abundance systematically declined in experimentally irrigated areas over a few months once the irrigation was terminated. If soil moisture can be restored to 10% saturation or less, Argentine abundances decrease. If, for example, Argentine ants were found to have invaded an area of the preserve, remediation of the causal factor in increasing soil moisture will reduce the abundance of the ant in that area.

Qualitative and quantitative monitoring for Argentine ants should be performed quarterly and include an overall review of the spineflower populations and habitats within the preserve and preserve buffer. Quarterly monitoring for Argentine ants should be adequate to detect incipient invasions based on the Suarez et al. (2001) study indicating that populations disperse at a rate of about 15 to 270 meters/year. The monitoring will note physiognomic changes and potential problems associated with Argentine ants such as evidence of increased moisture along the edge and within preserve areas. Systematic sampling for Argentine ants should be conducted using pitfall traps established as various points along the preserve-urban interface (see Appendix A for a sample field method).

The monitoring will inform management recommendations as necessary to maximize the likelihood that spineflower populations remain free of Argentine ant invasion and in a healthy state. Special attention should be placed on examining preserve edges, as these locations are where new ant invasions and other problems such as collecting moisture are often first detected. Quarterly assessments will also include a review of the preserve's physical features, including the condition of protective fencing, adjacent storm-drain outfalls, and BMPs to ensure they are functioning properly and not creating a suitable environment for Argentine ants.

Managing Infestations

Complete Argentine ant eradication in an urbanized environment is not feasible because it is well-established in southern California and is a very prolific colonizer. A more practical

objective is to control their populations and prevent their spread into new areas. The most effective approach is to control soil moisture at potential invasion points – in this case along the urban-preserve edge.

If ants appear, there are generally two distinct approaches to direct controls: (1) source or nest/mound treatment, and (2) broadcast applications.

Source or nest/mound treatment requires locating the colonies nest or mound and applying an insecticidal treatment in or around the nest. Delivery of the ant poison can be through a liquid drench treatment, dust or granule cover, or by fumigation. Ants must come in contact with the insecticidal agent and killing the colonies queen is imperative to success. Nest/mound treatment can be effective, but it can also be costly because it is labor intensive.

Broadcast applications involve the distribution of insecticidal bait over large infested areas. Baits work because ants share food and nutrients among one another. If food contains a slow-acting toxicant that is not detected it gets passed from ant to ant and eventually to the queen. Baits can also be applied in a source treatment at the nest/mound. Specific site conditions will dictate which treatment method will be appropriate to use. With any of these treatments special consideration must be given to special-status wildlife and plants that may be affected by the treatments, as well as the effects on non-target native ants and/or other beneficial insects.

Through quarterly monitoring along the preserve edge it should be possible to identify trouble spots fairly early before large colonies become established. If only a few ants (scouts) are trapped and soil moisture conditions in the area appear to be low enough to preclude colonization, a localized search within 300-500 feet of the observation of the ants may be adequate to identify and fix a source of increased moisture (e.g., a leaking pipe, uncaptured run-off, etc.) that could create a future problem. If the monitoring reveals a high abundance of ants in the area, suggesting the presence of a nearby nest, the direct controls discussed above may be warranted.

Section 5. Summary and Conclusion

This paper reviewed the biology of the invasive Argentine ant and the risk of the Newhall spineflower preserves to invasions. This species is well-established in southern California and can be expected to invade areas adjacent to urban development that provide suitable habitat conditions, such as where soil moisture levels are allowed to remain relatively high (>10% soil saturation). The keys to controlling Argentine ants in the Newhall spineflower preserves include:

- Providing "dry zones" where typical soil moistures are maintained at levels below about 10% soil saturation between urban development and spineflower populations that will deter the establishment of nesting colonies of ants.

- Ensuring that landscape container plants installed within 200 feet of spineflower preserves are ant-free.

- Maintaining natural hydrological conditions in the spineflower preserves through the project design features for roadways, french drains, and storm drains that convey water away from the preserves.

- Using drought resistant plants in FMZs and minimizing irrigation to the extent feasible.

- Quarterly monitoring along the preserve-urban edge to detect incipient ant invasions and remedying any inadvertent sources of moisture that could create suitable ant habitat.

- Managing infestations that may occur through direct controls such as source or nest/mound treatment and/or broadcast applications.

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APPENDIX A

FIELD METHOD FOR SAMPLING FOR ARGENTINE ANTS

Pitfall trapping for Argentine ants is fairly straightfoward but should be conducted by a biologist/entomologist who can identify the local invertebrate fauna to species level to the extent possible and at least to genus level. The following except from Suarez et al. (1998) describes the basically field sampling methods. "The pitfall traps consisted of 60 mm (internal diameter at the mouth), 250-mL (8-oz) glass jars. The jars were placed in a pattern resembling five on a die with the corner jars being 20 m apart. The traps were filled halfway with a 50:50 water:Sierra Brand antifreeze mix (Safe Brands, Omaha, Nebraska, USA) was used because it is non-toxic and works as an excellent preservative of insects. The jars were dug into the ground so the lip of the jar was flush with the surface. The jars were collected after 5 d and all ants counted and identified. Pitfall traps are an effective method for sampling ant communities (Anderson 1995, 1997) and provide an estimate of ant activity for each species by counting the number of workers falling into the jars for each 5-d sample period.

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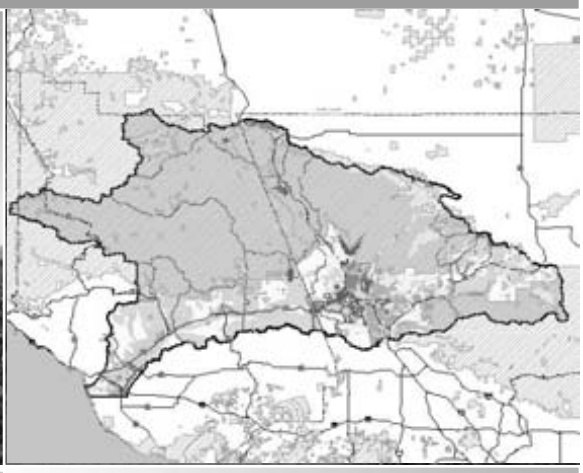
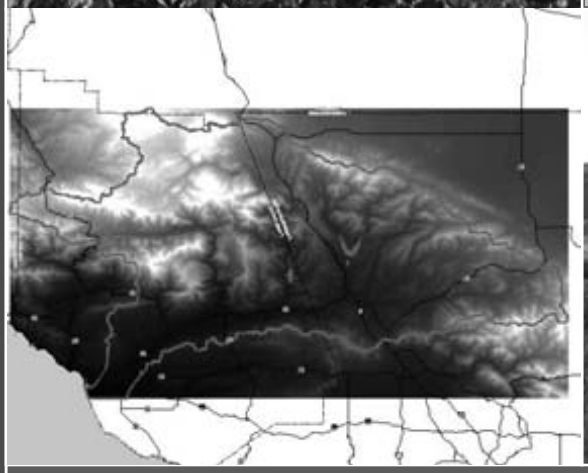
Santa Clara River Watershed Study





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1.0 INTRODUCTION

1.1 Purpose of Watershed Study

The purpose of the Santa Clara River Watershed (SCRW) study is to analyze the cumulative impacts of development, including past projects, current land use classifications, and future approved and planned projects, to biological and abiotic resources and ecological functions and processes within the watershed. While the vast majority of the SCRW is comprised of natural lands, land alterations in the form of agriculture and residential, commercial, and industrial urban uses have occurred in the Santa Clara Valley and adjacent foothills and substantial future development will occur.

The framework of the study is to describe existing and potential future development in the entire SCRW. This study relies on available data for baseline conditions, current land use classifications, planned and approved projects (only available for the Los Angeles County portion of the watershed[1]), existing vegetation and land use cover types, soils, geology, elevation and slopes, special-status biological resources and conceptual regional wildlife corridors and habitat linkages in the SCRW. These data and information are used to establish the current baseline conditions within the SCRW and the potential future conditions under current land classifications and with build-out of approved and planned projects. Information from permits issued between 1988 and 2006[2] by the U.S. Army Corps of Engineers (ACOE) and California Department of Fish and Game (CDFG) regarding jurisdictional wetlands and waters impacts and mitigation were also analyzed. This information allows for a specific analysis of cumulative jurisdictional wetlands/waters impacts within the SCRW. Within the watershed-wide context, the proposed Newhall projects are then analyzed in the context of overall cumulative impacts to the SCRW. This analysis demonstrates that the ultimate additional impacts in the SCRW resulting from the Newhall projects are relatively small in proportion to the overall watershed and are substantially reduced from what would occur under the current land use classifications.

It should be noted that two other studies have examined existing and future conditions in the Santa Clara River Watershed: (1) report entitled *Ecological Impact Assessment of Urban Development on the Santa Clara River Watershed, California* prepared by the Conservation Biology Institute in August 2005; and (2) report entitled, *Santa Clara River Upper Watershed Conservation Plan* prepared by The Nature Conservancy in Fall 2006.

[1] Dudek contacted Ventura County to obtain digital spatial information for planned and approved projects but those data were not available from the county.

[2] The permits from CDFG date back to 1983 but the information provided on those permits was insufficient to quantify impacts. Therefore, impacts were quantified beginning from 1988.

2.0 METHODS

2.1 Assemblage of Baseline Data

Baseline data for the analyses presented here were compiled from several data sources:

- Current land use classifications and existing public lands and open space areas based on county and city general plans: California Resources Agency/University of California, Davis (2004)
- Watershed and sub-basin data: CalWater Version 2.2 (http://gis.ca.gov/meta. epl?oid=22175)
- Vegetation: California GAP Analysis Project (1999)
- Soils: National Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database
- Elevation and slope: USGS National Elevation Data

For special-status biological resources, CNDDB element occurrences within the SCRW for vegetation communities and state- and/or federally-listed threatened and endangered species were included. For the analysis of regional wildlife corridors and habitat linkages, two main documents were used: the *South Coast Missing Linkages Project: A Linkage Design for the Santa Monica-Sierra Madre Connection* (Penrod et al. 2006) and the *Missing Linkages: Restoring Connectivity to the California Landscape* (Penrod 2000).

2.2 Compilation of Approved and Proposed Wetland Impact Permits

A measure of cumulative impacts to wetland and aquatic resources in the SCRW is the number of past projects processed and approved by CDFG and ACOE that impact state and federal waters and wetlands. CDFG provided Dudek a list of Streambed Alteration Agreements (SAAs) and ACOE provided a list of Nationwide Permits (NWPs) and Individual Permits (IPs) issued by the respective agencies within the SCRW between 1988 and 2006. The information provided in the permits and related documents includes: (1) acreages of temporary and permanent impacts to jurisdictional wetlands and waters of the state and/or U.S.; (2) mitigation measures; (3) net loss or gain of jurisdictional waters/wetlands; and (4) special-status species impacted by a project. While generally there was overlap of projects in the CDFG and ACOE lists, not every project occurs in both tables; in some cases project information may have been available from only one of the agencies.

In order to obtain additional information for the analysis, Dudek staff spent a total of four days at the Ventura office of the ACOE and four days at the Southwestern Regional office of CDFG

reviewing and compiling the permits and related information from the permit files made available by the agencies. Dudek reviewed ACOE and CDFG files and compiled information in each of the following categories wherever possible: permit number, applicant, project description, temporary impacts to waters or wetlands, permanent impacts to waters or wetlands, total mitigation, net gain/loss of waters of the state and/or U.S., permit type, related actions, special-status species, mitigation, and any relevant notes. To calculate the net gain/loss of waters/wetlands for a particular project, the total permanent impacts were subtracted from the total mitigation (e.g., if a project permanently impacted 2 acres of wetlands/waters and mitigation was 6 acres, the net gain of the project was 4 acres). There were cases where it was unclear whether the mitigation was entirely defined as jurisdictional waters/wetlands, such as preserving 40 acres through a conservation easement but without indicating whether all 40 acres were jurisdictional. In these cases, the mitigation listed in the spreadsheet was used or the best available information provided in the permit file was used. If there was no specific mitigation acreage listed in the spreadsheet or found in the permit and related documents, mitigation was not credited to the project.

The variability of the information in the CDFG and ACOE permit files did not allow for a precise quantitative description and analysis of cumulative impacts of projects on jurisdictional areas. However, the analysis is based on the best available information.

2.3 Impacts from Planned and Approved Projects

As noted above in *Subsection 2.1*, current land use classification information was obtained from the California Resources Agency/UC Davis (2004) study. However, because this dataset is based on county and city general plans, the actual approved and planned projects in an area may be quite different from what is designated in the general plans; general plan amendments and zone changes are common as land planning becomes more detailed and specific to a project. It is relatively common for specific plan and individual project-level on-the-ground impacts to be substantially less than would be allowed under original general plan land use designations.

In order to provide a more accurate portrayal of future development and open space planning in the SCRW, data for planned and approved projects within the watershed were obtained from the City of Santa Clarita and Los Angeles County. These include both Newhall and other projects. Several attempts were made to obtain specific quantitative project data for Ventura County, but specific project footprint information was not available. Consequently, the analysis of planned and approved projects is limited to Los Angeles County and at this time projections for Ventura

County can only be based on the current general plan land use classification information, which, as noted above, likely overstates the actual impacts.

2.4 Impact of Proposed Newhall Development

The approved and planned project dataset includes future Newhall projects and allows for a comparison to the current land use classifications with regard to future impacts in the SCRW. Newhall projects were classified as development or non-developed lands within the following categories: Conservation Easement, High Country Special Management Area (SMA), Salt Creek Area, River Corridor SMA, and Open Area. Open Area includes areas that will not be developed, but are not specifically designated as reserves or conservation easements. With regard to watershed function, open space would retain pervious surfaces, most in a natural state, but with some tributary areas re-engineered to elevations above their current condition. In addition, the Newhall project data are compared to the baseline data in the context of the percent of the total area (sub-basin, vegetation type, etc.) that will preserved and developed as compared to existing baseline conditions and current land use classifications for potential development and open space.

3.0 RESULTS

This section presents the results of the analyses conducted for this study.

- *Subsection 3.1* presents the baseline information for the SCRW based on current land use classifications, vegetation, geologic types, soils, elevations, and slopes.

- *Subsection 3.2* presents the results of the ACOE and CDFG jurisdictional impacts and mitigation analysis for permits issued between 1988 and 2006. This subsection analyzes the relationship between impacts and the cumulative net increase in jurisdictional acreage through mitigation.

- *Subsection 3.3* presents the results of the projected impacts of planned and approved projects in the Los Angeles County portion of the SCRW in the context of the entire watershed and the watershed sub-basins, and how these project impacts relate to the potential impacts under the current land use classification baseline data presented in *Subsection 3.1*. This subsection demonstrates that planned and approved projects would result in a substantial reduction of impacts to the SCRW compared to those under the current general plan land use classifications.

- *Subsection 3.4* takes the *Subsection 3.3* analysis to the level of Newhall projects and again compares the proposed Newhall project impacts to those under the current general plan land use classifications to demonstrate whether and how the proposed Newhall

projects substantially reduce impacts in the watershed compared to what could occur under current land use classifications.

For ease and clarity of presentation, the data in the tables presented in the main body of this document have been simplified to illustrate the main points of the analyses. The following tables show Classified Developed and Open Space designations. *Appendix A* to this document presents comprehensive tables that show breakdowns for theses different development classifications – Commercial, Residential, and Mixed Use – and their densities (Very Low, Low, Medium and High) where applicable, and Open Space designations - Open Space and Urban Reserve.

3.1 Baseline Data

3.1.1 Current Land Use Classifications

Table 1 provides the baseline data for the currently classified land uses in the SCRW broken down by the 14 sub-basins that comprise the watershed.[4] It includes the total acres and percentage in each of the sub-basins and the grand total for the SCRW and the acres and percentages of current classified development and open space for each sub-basin. Current classified development in *Table 1* and all following tables includes commercial (low-density, high-density, and industrial), residential (very low-, low-, medium-, high-density, and planned development), and mixed use. Open space includes urban reserve lands (California Resources Agency/UC Davis 2004). The reader is directed to *Table A-1* of *Appendix A* for the specific breakout of these categories.

The SCRW drains approximately 1,036,571 acres (1,620 square miles) of natural and urban areas north and east of Los Angeles in southern California (see *Figure 1*). The watershed is divided into 14 sub-basins shown in *Figure 2*. These sub-basins range in size from 7,433 acres (Sisar in the western part of the watershed) to 291,730 acres (Eastern). Most of the 14 sub-basins are relatively small and only three sub-basins have more than 100,000 acres – Eastern, Piru, and Topa Topa – accounting for 60% of the total watershed.

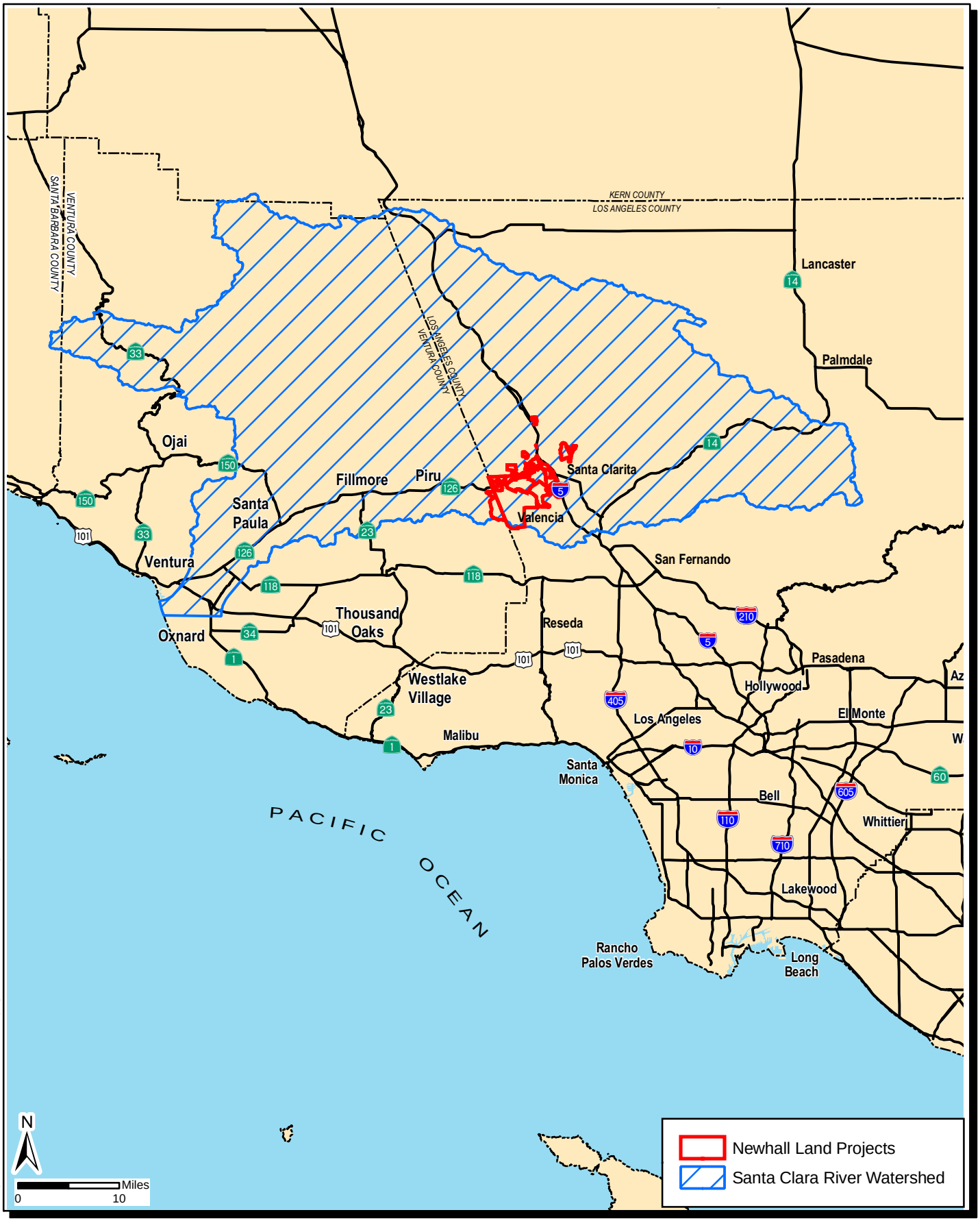
[4] The current land uses classifications refer to general plan designations only and do not reflect whether the land has actually been developed or not. For example, an area classified commercial may currently support undeveloped, agriculture, or residential land uses. The acreages of land uses classifications cannot be directly compared to existing acreages of current land uses.

TABLE 1
Santa Clara River Watershed Sub-basins and Current Land Use Classifications

	Sub-basin Totals		Land Use Totals		Land Use Percentages	
Sub-basin	**Acres**	**Percent**	**Classified Developed**	**Open Space**	**Classified Developed**	**Open Space**
Acton	88,787	8.6%	37,251	51,536	42.0%	58.0%
Bouquet	8,699	0.8%	1,290	7,409	14.8%	85.2%
Eastern	291,730	28.1%	131,631	160,099	45.1%	54.9%
Fillmore	49,154	4.7%	26,641	22,513	54.2%	45.8%
Hungry Valley	39,300	3.8%	2,625	36,675	6.7%	93.3%
Mint Canyon	10,836	1.0%	3,537	7,299	32.7%	67.3%
Santa Felicia	78,066	7.5%	29,994	48,072	38.4%	61.6%
Sierra Pelona	9,677	0.9%	6,624	3,053	68.5%	31.5%
Sisar	7,433	0.7%	1,313	6,120	17.7%	82.3%
Stauffer	37,470	3.6%	10,327	27,143	27.6%	72.4%
Sulfur Springs	66,033	6.4%	31,635	34,398	47.9%	52.1%
Topa Topa	160,416	15.5%	4,204	156,212	2.6%	97.4%
undefined	19,805	1.9%	11,960	7,845	60.4%	39.6%
Upper Piru	169,166	16.3%	4,014	165,152	2.4%	97.6%
Total Watershed	**1,036,571**	**100.0%**	**303,045**	**733,526**	**29.2%**	**70.8%**

Based on the California GAP Analysis data, as of 1999 (the last update of the vegetation database), approximately 100,000 acres (10%) of the SCRW had been converted to agriculture or some type of developed or disturbed land cover (see *Table 2* and *Subsection 3.1.2* for discussion of vegetation communities and land cover types). Under current land use classifications, approximately 303,045 acres of the SCRW are currently classified some type of development (including potential conversion of 85% of agricultural lands to urban uses), which could result in some type of man-made conversion in 29% of the watershed at buildout. About 157,500 acres (52%) of this is classified as very low-density residential (see *Table A-1* of *Appendix A*). It should be noted that in Ventura County proposed urban development of agricultural lands has been successfully challenged by SOAR (Save Open-Space and Agricultural Resources). Nine jurisdictions within Ventura County have enacted SOAR ordinances/initiatives. The SOAR boundaries (also called City Urban Restriction Boundaries [CURB]) in Ventura County require city voter approval before any land located outside CURB lines can be developed under the city's jurisdiction for urban purposes and thus provide the public the right to vote before development occurs on agricultural and open space lands.

Because of inherent topography, historical land uses, and ownership patterns, existing and classified land uses are variable among the sub-basins. *Table 3* summarizes the amount of land conversion for agriculture and urban development that had occurred in the sub-basins as of 1999 according to the California GAP Analysis data. In terms of total area converted, the Eastern sub-basin has the most land conversion at 27,353 acres (9% of sub-basin) (see *Figure 3*). The Sulfur Springs and Fillmore sub-basins have the most agricultural conversion at 15,360 acres (31%) and 12,404 acres (19%), respectively. In terms of percentage converted, the undefined sub-basin that includes the City of Ventura is the most converted at 79%. Most of the agriculture and urban development in the SCRW has occurred within and is classified for the river valley area and along the SR-14 corridor (*Figure 3* and *4*), which includes from west to east the "undefined" sub-basin that includes the City of Ventura (60% classified developed), Sulfur Springs sub-basin (48% classified developed), Fillmore sub-basin (54% classified developed), Santa Felicia sub-basin (38% classified developed), Eastern sub-basin (45% classified developed), and Acton sub-basin (41% classified developed). At 291,730 acres, Eastern is the largest sub-basin in the watershed, comprising 28% of the sub-basin. Combined, these sub-basins comprise about 593,575 acres (57%) of the SCRW and about 242,469 acres (80%) of the 303,045 acres of currently classified as development in the watershed. It is important to note, however, that most of the upper part of the Eastern sub-basin is open space (contained within the Angeles National Forest) (*Figure 3*).



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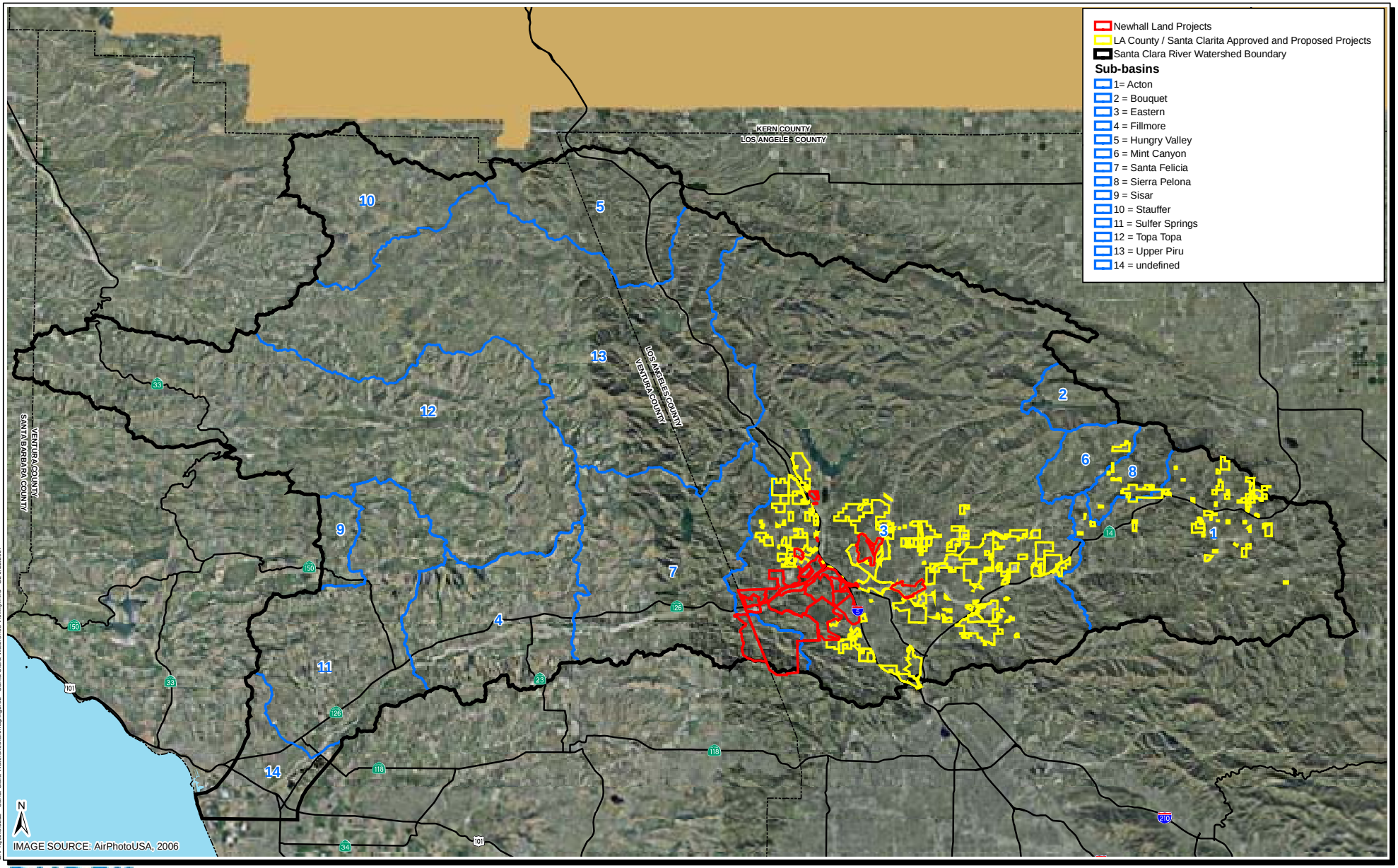
Newhall Land - Santa Clara River Watershed

Regional Map

FIGURE
1



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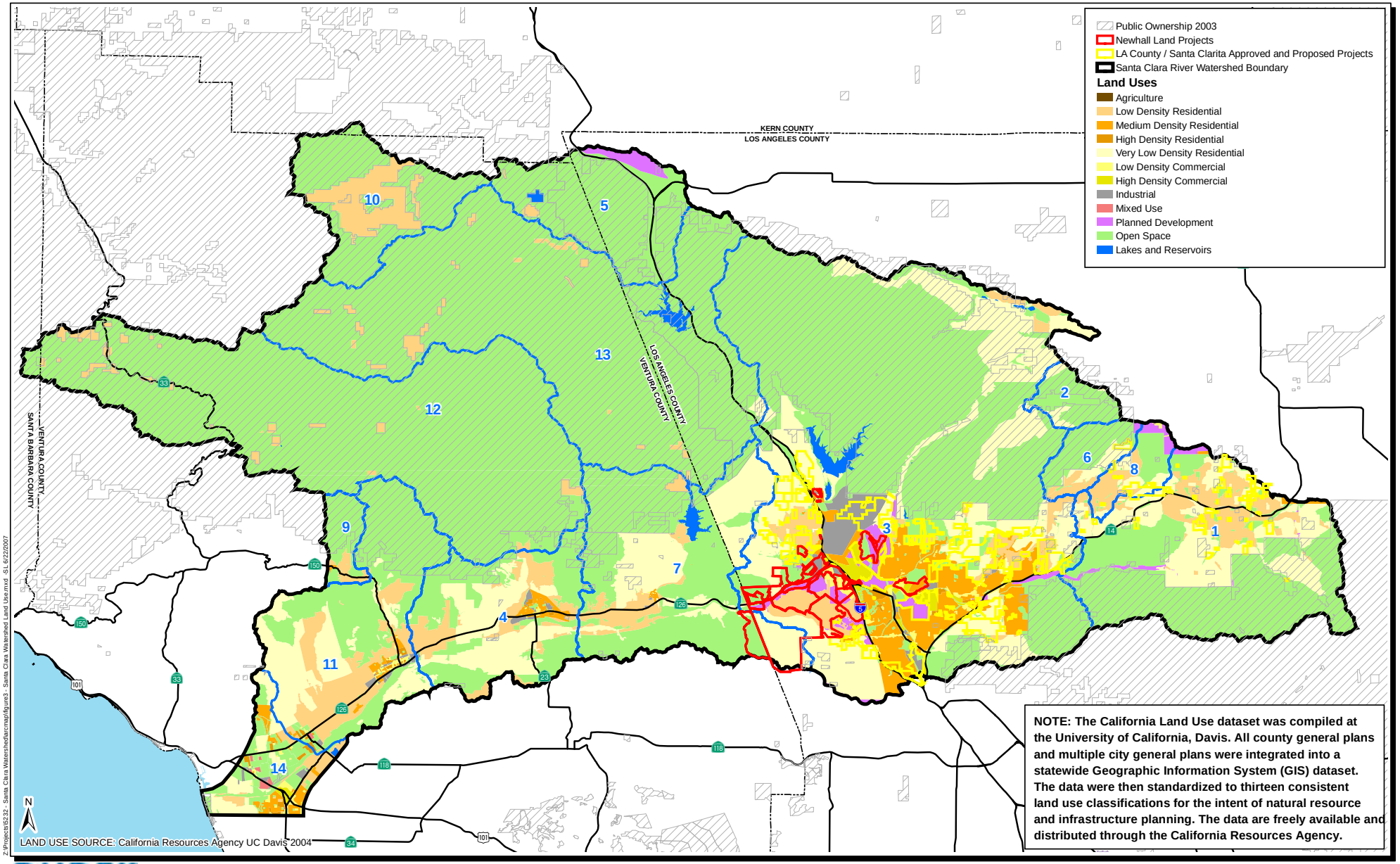
Newhall Land - Santa Clara River Watershed
Vicinity Map

FIGURE
2



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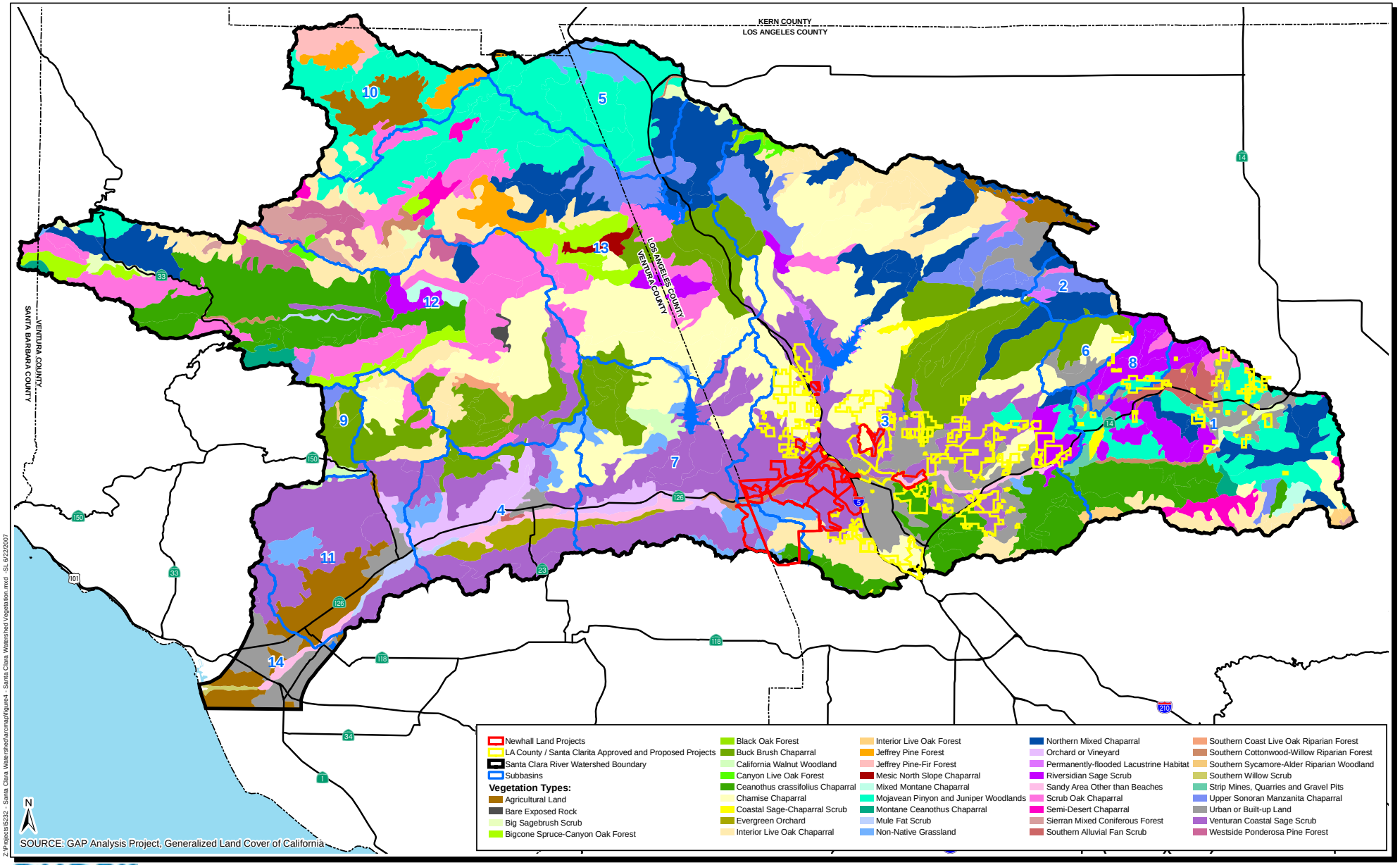
Newhall Land - Santa Clara River Watershed

Current Land Use Classifications

FIGURE 3



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0 7.5 15 Miles

Newhall Land - Santa Clara River Watershed

Existing Vegetation Types

FIGURE 4

TABLE 2
Vegetation Communities and Land Cover Types in the Santa Clara River Watershed

Vegetation and Land Cover Type[a]	Vegetation Totals		Land Use Totals		Land Use Percentages	
	Acres	Percent	Classified Developed	Open Space	Classified Developed	Open Space
Big sagebrush scrub	4,996	0.5%	2,120	2,877	42.4%	57.6%
Coastal Scrubs						
Coastal sage/chaparral scrub	2,452	0.2%	207	2,245	8.4%	91.6%
Riversidean sage scrub	29,418	2.8%	13,534	15,884	46.0%	54.0%
Southern alluvial fan scrub	5,062	0.5%	4,564	498	90.2%	9.8%
Venturan coastal sage scrub	144,932	14.0%	73,469	71,463	50.7%	49.3%
Subtotal	***181,864***	***17.5%***	***91,774***	***90,090***	***50.5%***	***49.5%***
Chaparrals						
Buck brush chaparral	88,367	8.5%	7,729	80,638	8.7%	91.3%
Ceanothus crassifolius chaparral	76,116	7.3%	13,663	62,453	18.0%	82.0%
Chamise chaparral	131,091	12.6%	26,536	104,555	20.2%	79.8%
Interior live oak chaparral	73,273	7.1%	16,161	57,113	22.1%	77.9%
Mesic north slope chaparral	1,778	0.2%	0	1,778	0.0%	100.0%
Mixed montane chaparral	2,676	0.3%	20	2,656	0.8%	99.2%
Montane ceanothus chaparral	3,582	0.3%	299	3,283	8.4%	91.6%
Northern mixed chaparral	70,033	6.8%	14,167	55,865	20.2%	79.8%
Scrub oak chaparral	67,134	6.5%	3,291	64,083	3.9%	95.5%
Semi-desert chaparral	6,695	0.6%	176	6,519	2.6%	97.4%
Upper Sonoran manzanita chaparral	30,291	2.9%	3,291	26,999	10.9%	89.1%
Sub-total	***551,035***	***53.2%***	***85,094***	***465,942***	***15.4%***	***84.6%***
Non-native grassland	22,240	2.1%	9,454	12,786	42.5%	57.5%
Riparian/Wetland						
Mulefat scrub	2,587	0.2%	1,145	1,443	44.2%	55.8%
Permanently-flooded lacustrine habitat	5,014	0.5%	396	4,618	7.9%	92.1%
Southern coast live oak riparian forest	1,392	0.1%	0	1,392	0.0%	100.0%

TABLE 2
Vegetation Communities and Land Cover Types in the Santa Clara River Watershed

Vegetation and Land Cover Type[a]	Vegetation Totals		Land Use Totals		Land Use Percentages	
	Acres	Percent	Classified Developed	Open Space	Classified Developed	Open Space
Southern cottonwood/willow riparian forest	4,641	0.4%	2,103	2,539	45.3%	54.7%
Southern sycamore/alder riparian woodland	111	0.0%	0	111	0.0%	100.0%
Southern willow scrub	539	0.1%	159	380	29.5%	70.5%
Subtotal	***14,283***	***1.4%***	***3,802***	***10,481***	***26.6%***	***73.4%***
Woodland & Forest						
Bigcone spruce/canyon oak forest	15,974	1.5%	310	15,664	1.9%	98.1%
Black oak forest	925	0.1%	0	925	0.0%	100.0%
California walnut woodland	3,624	0.3%	1,373	2,251	37.9%	62.1%
Canyon live oak forest	1,951	0.2%	0	1,951	0.0%	100.0%
Interior live oak forest	1,783	0.2%	0	1,783	0.0%	100.0%
Jeffrey pine forest	10,169	1.0%	0	10,169	0.0%	100.0%
Jeffrey pine/fir forest	5,258	0.5%	22	5,236	0.4%	99.6%
Mojavean pinyon and juniper woodlands	98,151	9.5%	21,848	76,303	20.3%	77.7%
Sierran mixed coniferous forest	5,251	0.5%	0	5,251	0.0%	100.0%
Westside ponderosa pine forest	10,124	1.0%	409	9,715	4.0%	96.0%
Subtotal	***153,210***	***14.8%***	***23,963***	***129,248***	***15.6%***	***84.4%***
Other Natural Land Covers						
Bare exposed rock	702	0.1%	0	702	0.0%	100.0%
Sandy area other than beaches	8,191	0.8%	4,421	3,769	**54.0%**	**46.0%**
Sub-total	**8,892**	**0.9%**	**4,421**	**4,471**	**49.7%**	**50.3%**
Agricultural land	28,791	2.8%	22,944	5,847	79.7%	20.3%
Evergreen orchard	6,236	0.6%	5,722	515	91.7%	8.3%
Orchard or vineyard	16,676	1.6%	15,537	1,139	93.2%	6.8%
Subtotal	***51,703***	***5.0%***	***44,202***	***7,501***	***85.5%***	***14.5%***

TABLE 2
Vegetation Communities and Land Cover Types in the Santa Clara River Watershed

Vegetation and Land Cover Type[a]	Vegetation Totals		Land Use Totals		Land Use Percentages	
	Acres	Percent	Classified Developed	Open Space	Classified Developed	Open Space
Developed/Disturbed Lands						
Open pit mines, quarries, and gravel pits	1,056	0.1%	169	887	16.0%	84.0%
Urban or built-up land	47,286	4.6%	38,045	9,241	80.5%	19.5%
Subtotal	***48,342***	***4.7%***	***38,214***	***10,129***	***79.0%***	***21.0%***
Grand Total	**1,036,567**		**303,044**	**733,523**	**29.2%**	**70.8%**

[a] Nomenclature for the vegetation communities and land cover types follows Holland (1986) which is used for the state vegetation dataset and which is the only vegetation dataset available for the entire SCRW.

TABLE 3
Conversion of Lands for Agriculture and Urban Uses by Sub-basin as of 1999

		Agricultural Lands					Developed/Disturbed Lands				Total Converted Lands	
Sub-basin	Sub-basin Totals	General Agricultural Lands	Evergreen Orchard	Orchard/ Vineyard	Total Agricultural	Percent Agricultural	Open Pit Mines and Quarries	Urban or Built-up	Total Developed	Percent Developed	Total Acres Converted	Percent Converted
Acton	88,787	0	0	0	0	0.0%	1,050	7,192	8,242	9.3%	8,242	9.3%
Bouquet	8,699	0	0	0	0	0.0%	0	79	79	0.9%	79	0.9%
Eastern	291,730	3,935	0	0	3,935	1.3%	6	23,412	23,418	8.0%	27,353	9.4%
Fillmore	49,154	5	5,278	10,077	15,360	31.2%	0	1,394	1,394	2.8%	16,754	34.1%
Hungry Valley	39,300	0	0	0	0	0.0%	0	0	0	0.0%	0	0.0%
Mint Canyon	10,836	0	0	0	0	0.0%	0	2,372	2,372	21.9%	2,372	21.9%
Santa Felicia	78,066	0	959	5,011	5,970	7.6%	0	0	0	0.0%	5,970	7.6%
Sierra Pelona	9,677	0	0	0	0	0.0%	0	626	626	6.5%	626	6.5%
Sisar	7,433	0	0	272	272	3.7%	0	0	0	0.0%	272	3.7%
Stauffer	37,470	8,060	0	0	8,060	21.5%	0	0	0	0.0%	8,060	21.5%
Sulfur Springs	66,033	11,112	0	1,292	12,404	18.8%	0	2,316	2,316	3.5%	14,720	22.3%
Topa Topa	160,416	0	0	23	23	0.0%	0	0	0	0.0%	23	0.0%
Undefined	19,805	5,683	0	0	5,683	28.7%	0	9,907	9,907	50.0%	15,590	78.7%
Upper Piru	169,166	0	0	0	0	0.0%	0	0	0	0.0%	0	0.0%
Total Watershed	**1,036,571**	**28,795**	**6,237**	**16,675**	**51,707**	**5.0%**	**1,056**	**47,298**	**48,354**	**4.7%**	**100,061**	**9.7%**

The remaining less developed sub-basins, which tend to comprise the more rugged terrain and higher elevations of the watershed, total approximately 442,997 acres and account for 60,575 acres (20%) of currently classified development. The percentage of classified development in these relatively undeveloped sub-basins ranges from about 2% in Upper Piru to 68% in Sierra Pelona. However, the two largest undeveloped sub-basins – Topa Topa and Upper Piru – account for approximately 321,364 acres (31%) of the watershed and are classified for only 8,218 acres (2.6%) of development as most of the this land is contained within the Los Padres National Forest.

3.1.2 Vegetation and Land Cover Types

Table 2 summarizes the vegetation and land cover types in the SCRW in regard to total acreages and percentages of the watershed and the current land use classifications for each. As described in the methods section, these data are from California GAP Analysis Project (1999) and follow the California Natural Diversity Database (CNDDB) vegetation classification system. It is important to understand that these data reflect regional landscape mapping and may differ from project-level vegetation mapping. However, they are useful for landscape-level analyses.

The SCRW supports a total of 40 vegetation and land cover types (*Figure 4*). *Table 2* organizes these 40 types into 9 general communities and cover types – big sagebrush scrub, coastal scrubs, chaparrals, non-native grassland, riparian/wetland, woodland and forest, other non-vegetated natural land covers, agricultural lands, and developed and disturbed lands. Chaparrals are by far the largest cover component in the watershed, comprising 53% of the watershed, and dominate the landscape in the rugged hills north of the Santa Clara River (*Figure 4*). Coastal scrubs and woodlands and forests are the next most common vegetation covers at 17% and 15% of the total, respectively. The coastal scrubs dominate the lower foothills along the river valley and the woodlands and forests primarily occur at the higher elevations. These three dominant general communities comprise 85% of the watershed.

Converted lands, including agricultural lands and developed/disturbed lands, currently comprise about 100,000 acres (10%) of the watershed based on the 1999 California GAP Analysis Project for vegetation coverage. The vast majority of existing converted lands are agriculture located along the river valley and adjacent foothills, and the communities of Ventura, Santa Paula, Fillmore, Valencia and Santa Clarita. There are also significant areas of agriculture in the Stauffer sub-area and northern portion of the Eastern sub-basin.

As noted above in *Subsection 3.1.1* and *Table 1*, about 303,045 acres (29%) of the SCRW are classified for development. In terms of acreages and percentages of the major vegetation communities, current land use classifications would result in the largest impacts to coastal scrubs, at 91,774 acres and 50% of the total. A relatively large acreage of chaparral also would

be developed (85,094 acres), but would impact only 15% of the total in the watershed. For woodlands and forests, 23,962 acres (16%) would be impacted under current land use classifications. For the smaller vegetation communities, 9,454 acres (42%) of non-native grassland and 3,802 acres (27%) of riparian/wetland would be impacted under current classifications.

3.1.3 Geologic Types

Table 4 summarizes the geologic types in the SCRW. The SCRW is geologically quite diverse, with 19 different geologic types, including a mapping for water (*Table 4* and *Figure 5*). The dominant geologic type – Ecocene marine – accounts for only 15% of the watershed, and the four most dominant types, including Ecocene marine, Miocene marine, Plio-Pleistocene nonmarine and Pliocene nonmarine, and Precambrian rocks, account for about 51% of the total. The remaining 49% of the watershed is underlain by the other 15 types at percentages ranging from 0.3% (Miocene nonmarine) to 9.5% (Mesozoic granitic rocks).

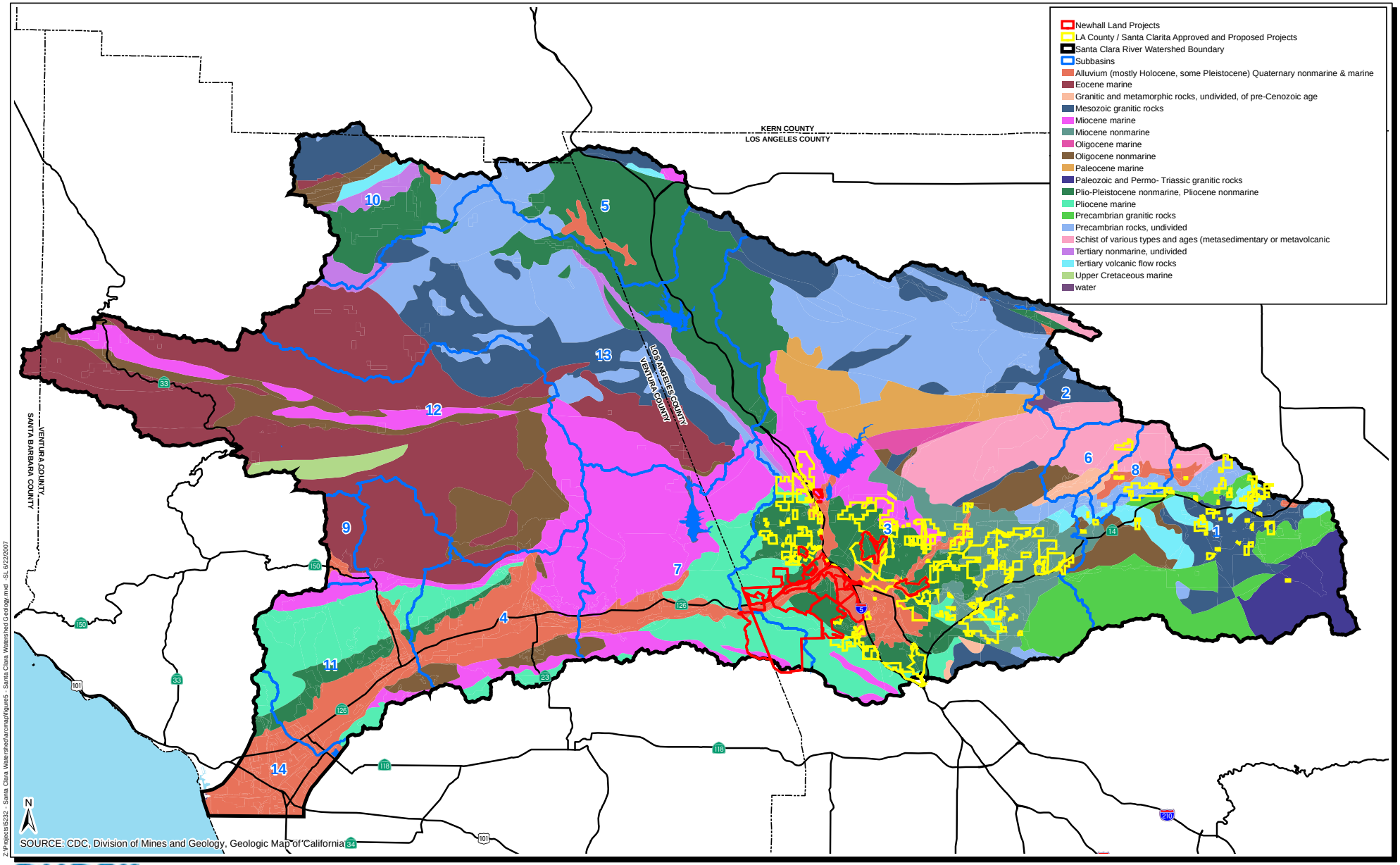
Under current land use classifications, all 19 geologic types would have potential development, ranging from 0.3% of upper Cretaceous marine to 75% of alluvium (Quaternary nonmarine and marine), which is located along the river valley (*Table 4* and *Figure 5*). About 73% of Miocene nonmarine, which comprises much of the valley (but only 3% of the total watershed), also could be developed under current land use classifications. Large areas of geologic types that dominate the rugged terrain at higher elevations would remain in open space, including Ecocene marine (97% in open space), Miocene marine (71% in open space), Precambrian rocks (83% in open space), and Plio-Pleistocene nonmarine and Pliocene nonmarine (65% in open space).

3.1.4 Soil Types

Table 5 summarizes the soil types in the SCRW and *Figure 6* shows their distribution. As with geologic types, the SCRW is highly diverse with 27 primary soil types. About 8,750 acres (<1%) of the watershed do not have mapped soils. As with geologic types, there is no clearly dominant soil type in the watershed, with the Millerton-Lodo-Millshom, which is largely associated with the Ecocene marine geologic type, as the most common type but only comprising 15% of the total watershed. However, 13 of the 27 soils comprise 94% of the total soil types in the watershed and four soils account for about 50% of the types.

TABLE 4
Geologic Types in the Santa Clara River Watershed in Relation to Current Land Use Classifications

Geologic Type	Geologic Totals		Land Use Totals		Land Use Percentages	
	Acres	Percent	Classified Developed	Open Space	Classified Developed	Open Space
Alluvium (Quaternary nonmarine & marine)	84,305	8.1%	63,535	20,771	75.4%	24.6%
Eocene marine	155,991	15.0%	4,014	151,978	2.6%	97.4%
Granitic and metamorphic rocks, pre-Cenozoic	3,666	0.4%	2,581	1,085	70.4%	29.6%
Mesozoic granitic rocks	98,814	9.5%	22,581	76,233	22.9%	77.1%
Miocene marine	123,761	11.9%	35,993	87,768	29.1%	70.9%
Miocene nonmarine	32,575	3.1%	23,934	8,641	73.5%	26.5%
Oligocene marine	3,508	0.3%	524	2,984	14.9%	85.1%
Oligocene nonmarine	57,235	5.5%	7,311	49,924	12.8%	87.2%
Paleocene marine	22,989	2.2%	676	22,313	2.9%	97.1%
Paleozoic and Permo-Triassic granitic rocks	16,422	1.6%	2,302	14,120	14.0%	86.0%
Pliocene marine	73,392	7.1%	39,175	34,217	53.4%	46.6%
Plio-Pleistocene nonmarine, Pliocene nonmarine	135,755	13.1%	46,944	88,811	34.6%	65.4%
Precambrian granitic rocks	38,984	3.8%	9,241	29,743	23.7%	76.3%
Precambrian rocks, undivided	117,724	11.4%	20,080	97,644	17.1%	82.9%
Schist (metasedimentary or metavolcanic)	38,909	3.8%	11,272	27,637	29.0%	71.0%
Tertiary nonmarine, undivided	12,487	1.2%	2,716	9,771	21.7%	78.3%
Tertiary volcanic flow rocks	12,286	1.2%	9,921	2,365	80.8%	19.2%
Upper Cretaceous marine	5,705	0.6%	43	5,662	0.7%	99.3%
Water	2,057	0.2%	200	1,857	9.7%	90.3%
Total	**1,036,567**		**303,043**	**733,523**	**29.2%**	**70.8%**



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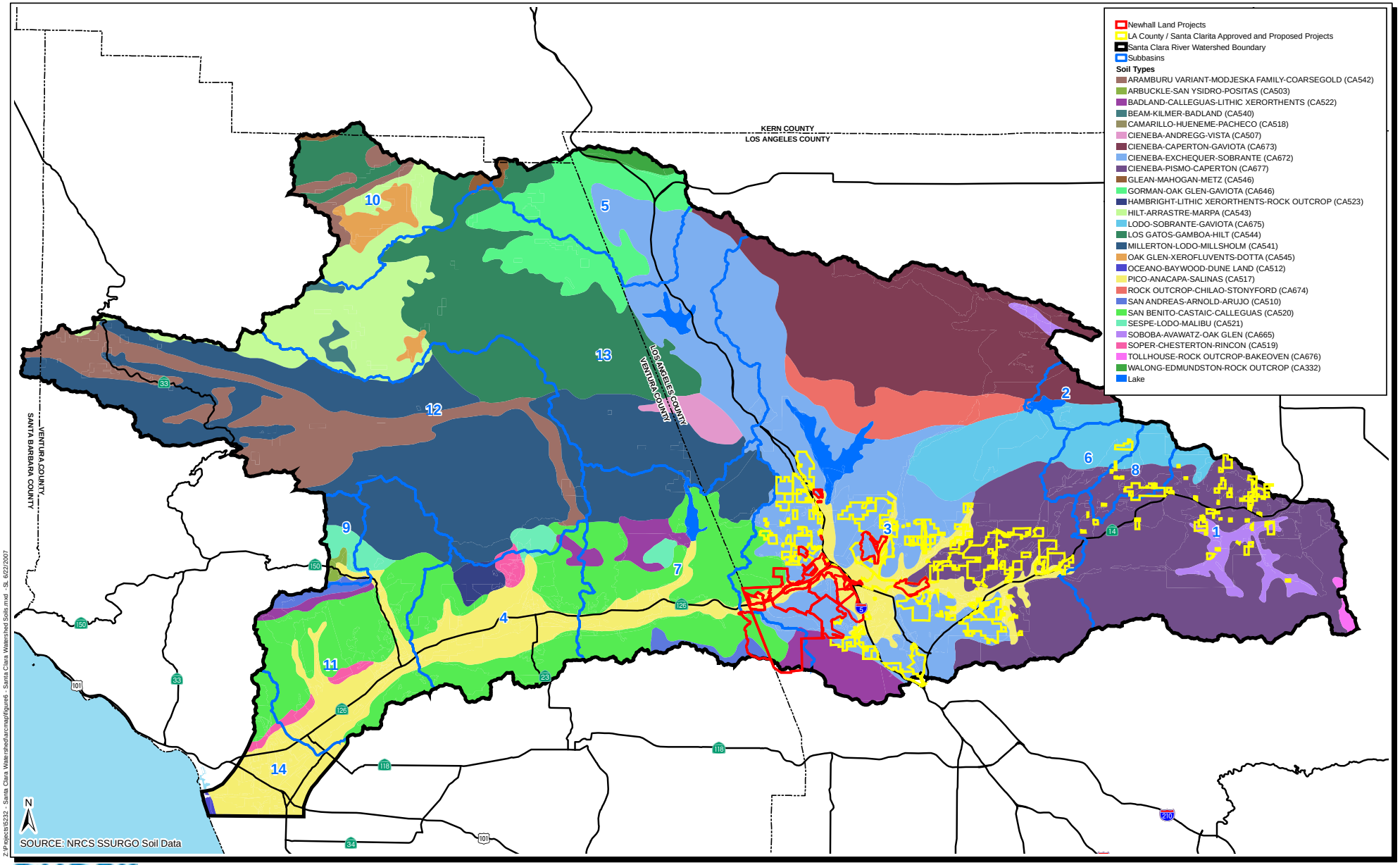
Existing Geologic Types

FIGURE 5

TABLE 5
Soil Types in the Santa Clara River Watershed in Relation to Current Land Use Classifications

Soil Type	Soil Totals		Land Use Totals		Land Use Percentages	
	Acres	Percent	Classified Developed	Open Space	Classified Developed	Open Space
Millerton-Lodo-Millsholm	153,429	14.8%	7,558	145,871	4.9%	95.1%
Cieneba-Exchequer-Sobrante	132,462	12.8%	52,017	80,444	39.3%	60.7%
Cieneba-Pismo-Caperton	129,534	12.5%	59,231	70,303	45.7%	54.3%
San Benito-Castaic-Calleguas	99,503	9.6%	40,158	59,346	40.4%	59.6%
Los Gatos-Gamboa-Hilt	90,317	8.7%	2,328	87,989	2.6%	97.4%
Pico-Anacapa-Salinas	84,613	8.2%	66,694	17,919	78.8%	21.2%
Cieneba-Caperton-Gaviota	81,270	7.8%	19,428	61,842	23.9%	76.1%
Aramburu Variant-Modjeska Family-Coarsegold	51,392	5.0%	4,631	46,761	9.0%	91.0%
Hilt-Arrastre-Marpa	42,864	4.1%	3,294	39,571	7.7%	92.3%
Gorman-Oak Glen-Gaviota	36,698	3.5%	1,475	35,223	4.0%	96.0%
Lodo-Sobrante-Gaviota	36,345	3.5%	10,146	26,199	27.9%	72.1%
Badland-Calleguas-Lithic Xerorthents	18,993	1.8%	13,747	5,246	72.4%	27.6%
Rock Outcrop-Chilao-Stonyford	17,800	1.7%	617	17,183	3.5%	96.5%
Soboba-Avawatz-Oak Glen	9,296	0.9%	5,881	3,415	63.3%	36.7%
(No Data)	8,757	0.8%	1,122	7,635	12.8%	87.2%
Sespe-Lodo-Malibu	8,086	0.8%	2,126	5,960	26.3%	73.7%
Oak Glen-Xerofluvents-Dotta	6,564	0.6%	4,976	1,588	75.8%	24.2%
Cieneba-Andregg-Vista	5,582	0.5%	0	5,582	0.0%	100.0%
San Andreas-Arnold-Arujo	5,518	0.5%	850	4,669	15.4%	84.6%
Soper-Chesterton-Rincon	4,443	0.4%	3,179	1,264	71.6%	28.4%
Hambright-Lithic Xerorthents-Rock Outcrop	3,510	0.3%	952	2,558	27.1%	72.9%
Walong-Edmundston-Rock Outcrop	2,853	0.3%	2,075	778	72.7%	27.3%
Beam-Kilmer-Badland	2,354	0.2%	0	2,354	0.0%	100.0%
Glean-Mahogan-Metz	1,948	0.2%	16	1,932	0.8%	99.2%
Tollhouse-Rock Outcrop-Bakeoven	1,074	0.1%	0	1,074	0.0%	100.0%
Arbuckle-San Ysidro-Positas	883	0.1%	354	529	40.1%	59.9%
Oceano-Baywood-Dune Land	374	0.0%	117	256	31.3%	68.7%
Camarillo-Hueneme-Pacheco	74	0.0%	74	1	98.8%	1.2%
Total	**1,036,534**		**303,046**	**733,490**	**29.2%**	**70.8%**



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Existing Soil Types

FIGURE 6

Three soil types – Cieneba-Andregg-Vista, Tollhouse-Rock Outcrop-Bakeoven, and Beam-Kilmer-Badland – would not be impacted under the current land use classifications. However, these three soils types only account for about 9,000 acres (<1%) of the watershed. Of the four soil types that comprise 50% of the watershed, a total of 158,964 acres (15%) would be impacted under current land use classifications. Soils types that would have the largest impacts and comprise significant areas include Pico-Anacapa-Salinas (79% impacted), Badland-Calleguas-Lithic Xerorthents (72% impacted), Soboba-Avawatz-Oak Glen (63% impacted), Oak Glen-Xerofluvents-Dotta (76% impacted), and Soper-Chesterton-Rincon (72% impacted). Overall, impacts to these soils would total approximately 94,476 acres, or 31% of total developed and 9% of the total watershed.

3.1.5 Elevations

Table 6 shows the elevations in the SCRW at 500-foot intervals and *Figure 7* shows their distribution. Elevations in the SCRW range from sea level to over 8,000 feet. Over 92% of the watershed is below 5,500 feet and about 62% is between 1,000 and 4,000 feet.

Some level of development could occur at all but the highest elevations (>8,000 feet) under current land use classifications, but the large majority of development would occur at elevations less than 4,000 feet. Of the 303,045 acres of potential development, 277,560 acres (92%) would occur at less than 4,000 feet, accounting for 37% of the 747,938 acres under 4,000 feet. A total 181,214 acres of development would occur at less than 2,000 feet, accounting for 59% of the 304,105 acres under 2,000 feet. Generally, at elevations between 1,500 and 4,500 feet, the relative proportion of very low-density residential to other development categories increases with elevation (see *Table A-5* of *Appendix A*). At elevations above 4,500 feet approximately 14,390 acres are classified as low-density residential compared to only 2,000 acres of very low-density residential. The majority of the classified low-density residential is accounted for by an area located in the northwestern corner of the watershed (*Figure 3*).

3.1.6 Slope

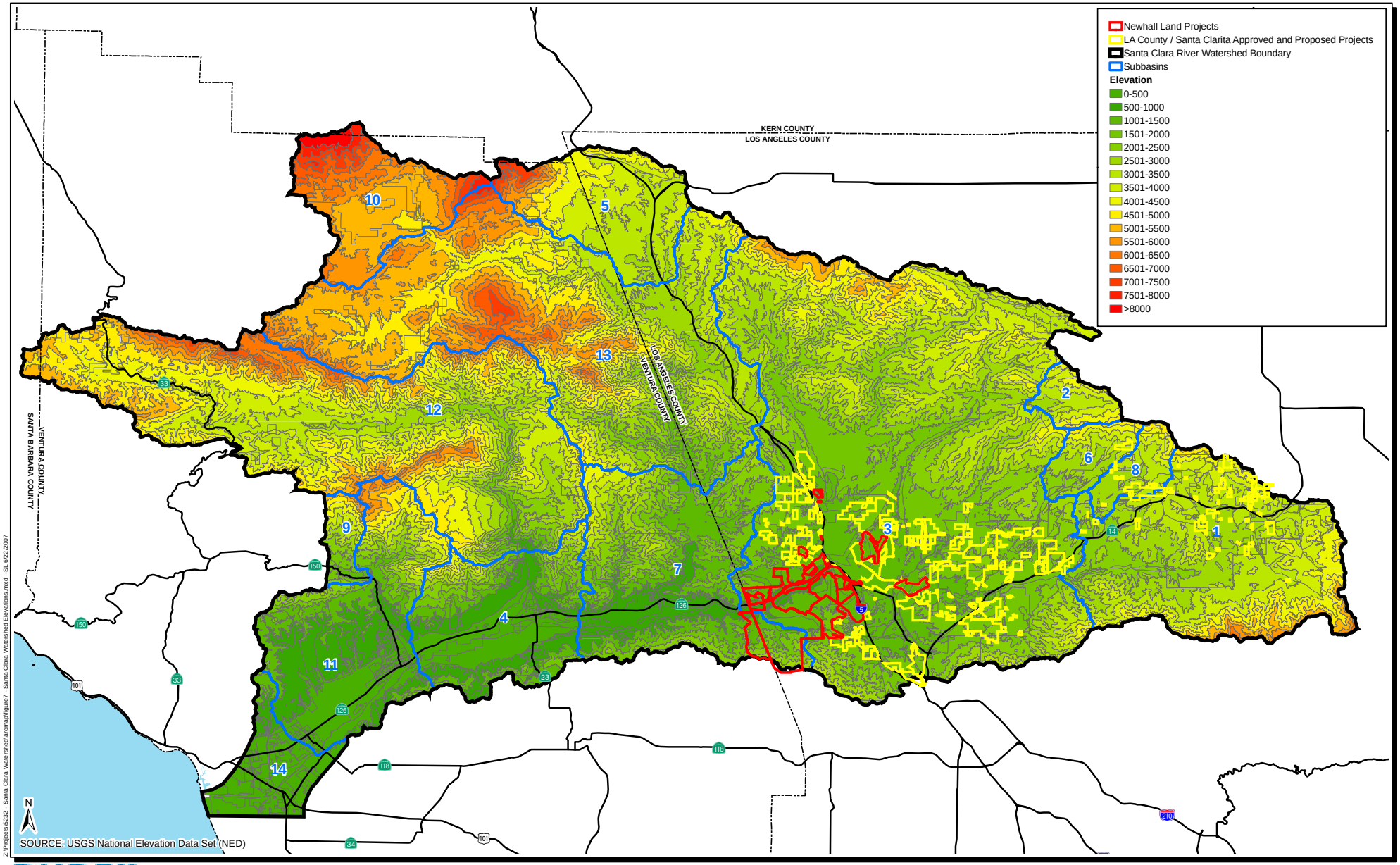
Table 7 shows slopes in the SCRW at 20% intervals and *Figure 8* shows their distribution. More than 70% of the SCRW has slopes less than 20%, with most of these areas associated with the Santa Clara River valley, but also in the northern portions of the watershed. Slopes greater than 40% are primarily located in the central portions of the watershed.

TABLE 6
Elevations in the Santa Clara River Watershed in Relation to Current Land Use Classifications

	Elevation Totals		Land Use Totals		Land Use Percentages	
Elevation (feet)	Acres	Percent	Classified Developed	Open Space	Classified Developed	Open Space
0–500	48,058	4.6%	35,292	12,766	73.4%	26.6%
500–1000	52,187	5.0%	33,249	18,938	63.7%	36.3%
1001–1500	95,436	9.2%	58,613	36,823	61.4%	38.6%
1501–2000	108,424	10.5%	54,061	54,364	49.9%	50.1%
2001–2500	86,661	8.4%	24,674	61,987	28.5%	71.5%
2501–3000	116,903	11.3%	27,257	89,646	23.3%	76.7%
3001–3500	135,348	13.1%	27,354	107,993	20.2%	79.8%
3501–4000	104,922	10.1%	17,060	87,862	16.3%	83.7%
4001–4500	75,120	7.2%	7,286	67,833	9.7%	90.3%
4501–5000	66,875	6.5%	6,307	60,568	9.4%	90.6%
5001–5500	68,878	6.6%	7,737	61,141	11.2%	88.8%
5501–6000	38,010	3.7%	2,594	35,416	6.8%	93.2%
6001–6500	20,474	2.0%	1,469	19,005	7.2%	92.8%
6501–7000	9,554	0.9%	15	9,539	0.2%	99.8%
7001–7500	5,206	0.5%	29	5,177	0.6%	99.4%
7501–8000	2,688	0.3%	2	2,685	0.1%	99.9%
>8000	1,550	0.1%	0	1,550	0.0%	100.0%
Total	**1,036,292**		**302,999**	**733,293**	**29.2%**	**70.8%**

TABLE 7
Slopes in the Santa Clara River Watershed in Relation to Current Land Use Classifications

	Elevation Totals		Land Use Totals		Land Use Percentages	
Slope	Acres	Percent	Classified Developed	Open Space	Classified Developed	Open Space
0-20%	723,464	70.0%	262,198	461,266	36.3%	63.7%
21-40%	302,688	29.2%	40,260	262,429	13.3%	86.7%
41%–100%	9,225	0.9%	262	8,963	2.8%	97.2%
Total	**1,035,377**		**302,719**	**732,658**	**29.2%**	**70.8%**



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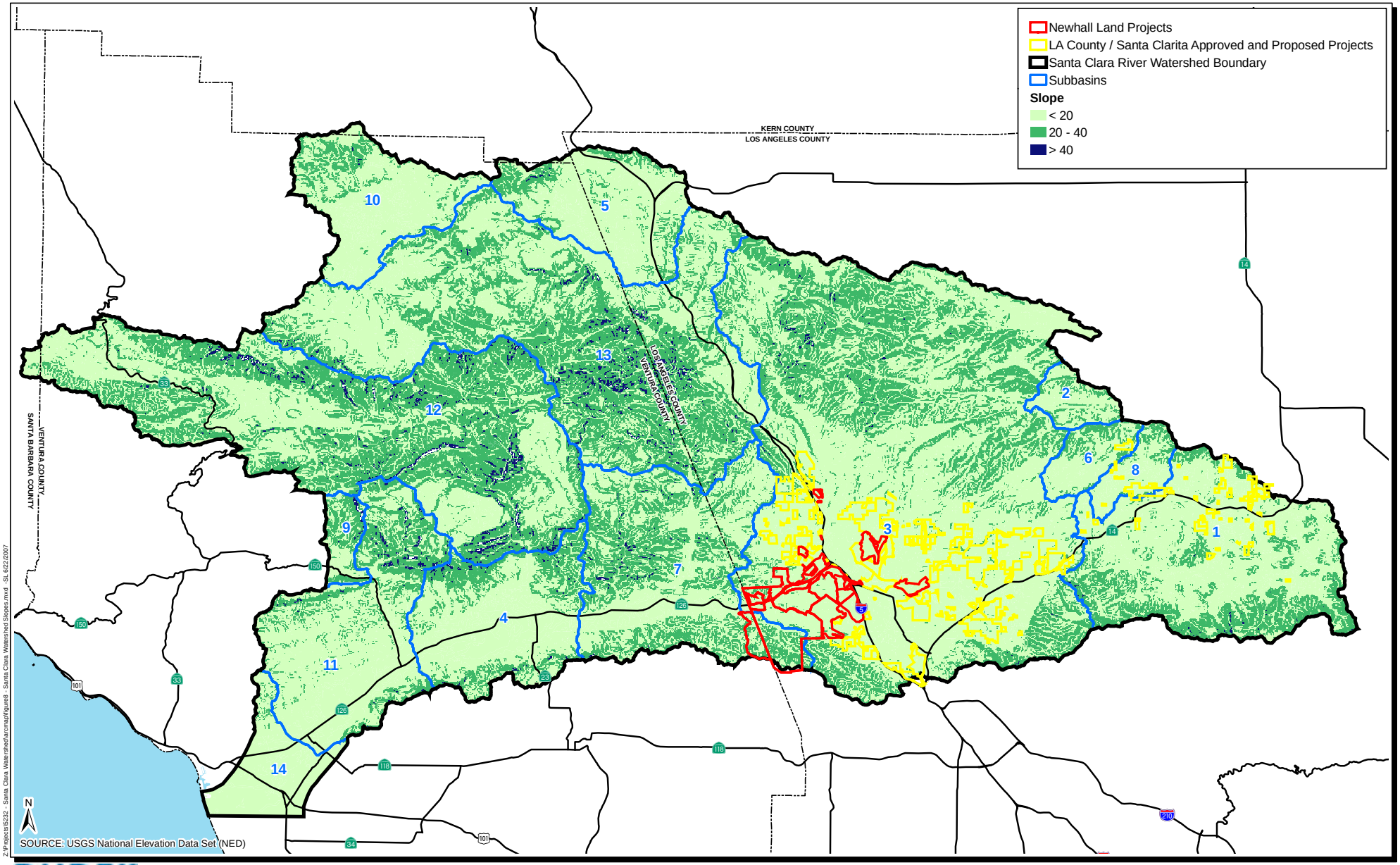
Elevations

FIGURE 7



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Santa Clara Watershed Slopes

FIGURE 8

Under current classifications, development would primarily occur at slopes less than 20%, accounting for 262,198 acres (86%) of potential development. A moderate amount of development potentially would occur at slopes of 21-30%, but approximately 77% of this development would be very low-density residential and 15% would be low-density residential (see *Table A-6* of *Appendix A*).

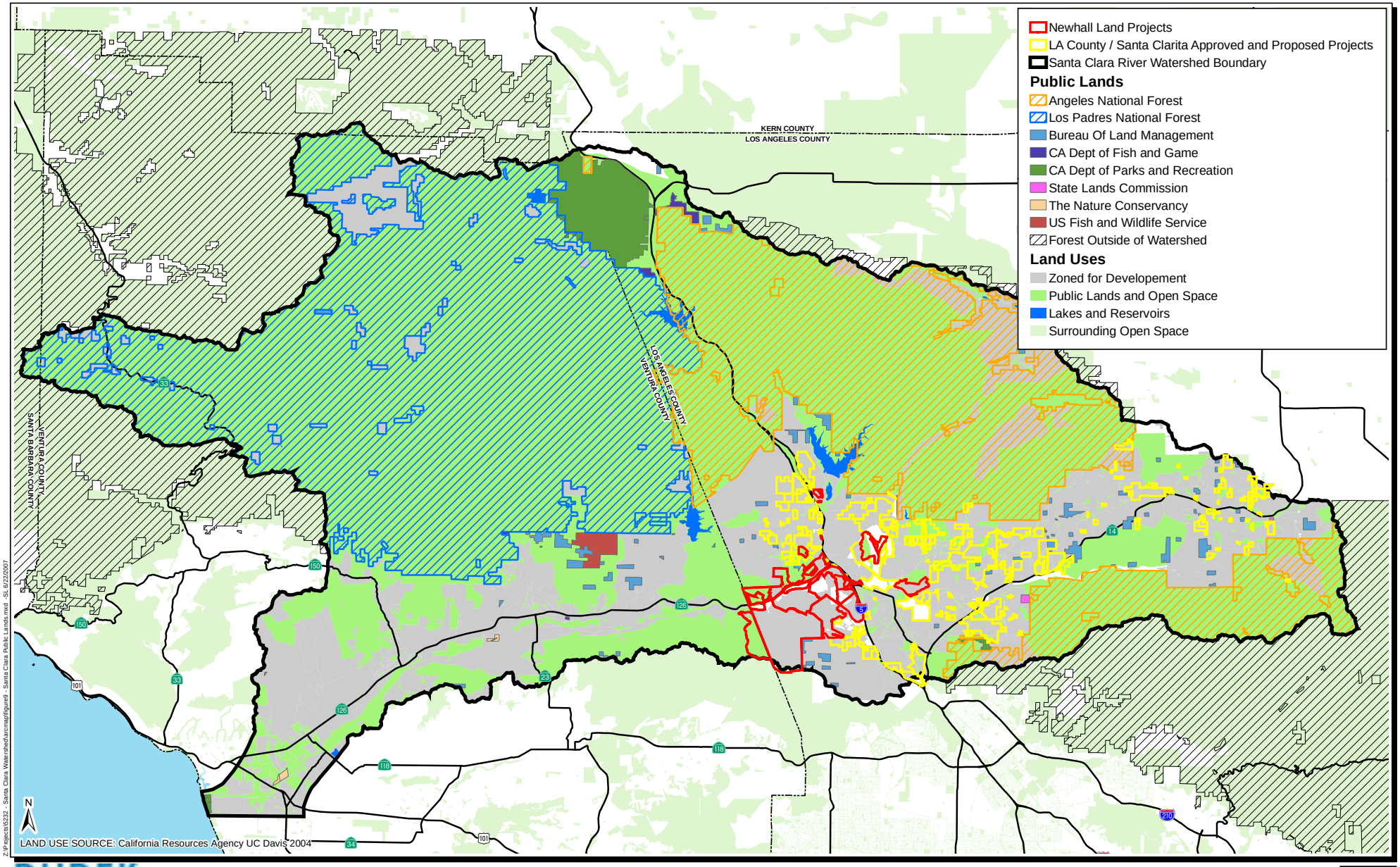
Consistent with the pattern of classified development concentrated in more level terrain, the percentage of open space increases as slopes increase, ranging from 52% on slopes less than 10% to 97% on slopes greater than 40%.

3.1.7 Existing Public Lands

Approximately 635,172 acres (61%) of the SCRW is already in public ownership as summarized in *Table 8* and shown in *Figure 9*. National Forest accounts for 95.2% of the public land. National Forest is also directly connected to the north and west and southeast and east of the watershed. The 635,172 acres of existing public lands account for 87% of the 733,523 total acres of classified open space depicted in *Figure 9*.

TABLE 8
Existing Public Lands

Owner/Manager	Acres	Percent of Total Public Lands	Percent of Total Watershed
Bureau of Land Management	8,291	1.3%	0.8%
California Department of Fish and Game	1,021	0.2%	0.1%
California Department of Parks and Recreation	18,496	2.9%	1.8%
State Lands Commission	191	0.03%	0.02%
The Nature Conservancy	312	0.04%	0.03%
U.S. Fish and Wildlife Service	2,363	3.7%	2.3%
U.S. Forest Service	604,499	95.2%	58.3%
Total	**635,172**		**61.3%**



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0 7.5 15 Miles

Newhall Land - Santa Clara River Watershed

Existing Public Lands and Open Space Areas

FIGURE 9

3.2 Cumulative Impacts to Jurisdictional Waters and Wetlands within the Watershed

As described in *Subsection 2.2*, cumulative impacts to wetland and aquatic resources in the SCRW were analyzed in terms of the number of past projects that impact state and federal waters and wetlands processed and approved by CDFG and ACOE between 1988 and 2006.

The compiled data for ACOE and CDFG permits are presented in *Figures 10* and *11*. The bar graphs in both figures show the absolute annual amount of impact (red bars) and mitigation (green bars), with absolute acres indicated on the left vertical axis. For example, in 1998, there was about 200 acres of ACOE impact and about 240 acres of mitigation. The cumulative acres (plotted as a black line against the right vertical axis) represent the cumulative difference between impacts (red bars) and mitigation (green bars). For example, by 2001, there was approximately 150 acres of net gain resulting from mitigation compared to impacts from ACOE permits. By 2006, there was about 275 acres net gain. As described in the methods, these data assume that all temporary impacts are fully mitigated. It should be noted that even though this line represents a cumulative difference, it does not increase every year. In years where there was more impact than mitigation, the cumulative line shows a decrease, such as 1991 in *Figure 10* and 1999 in *Figure 11*, because the "net" amount of the mitigation habitat relative to impacts declined.

Both sets of permits show a similar trend. Between 1988 and 1997, there was relatively little permit activity. Starting in 1998 for the ACOE and 2000 for CDFG, there was a consistent net gain in the cumulative acres of mitigation over impacts. The spikes in permit activity in 1998 for ACOE and 1999 for CDFG and 2005 for the ACOE are linked to the 1997–1998 El Niño event and the powerful winter storms in 2004–2005. The permit descriptions for 1998 included several relating to emergency repairs from flooding, and not to development-related permits.

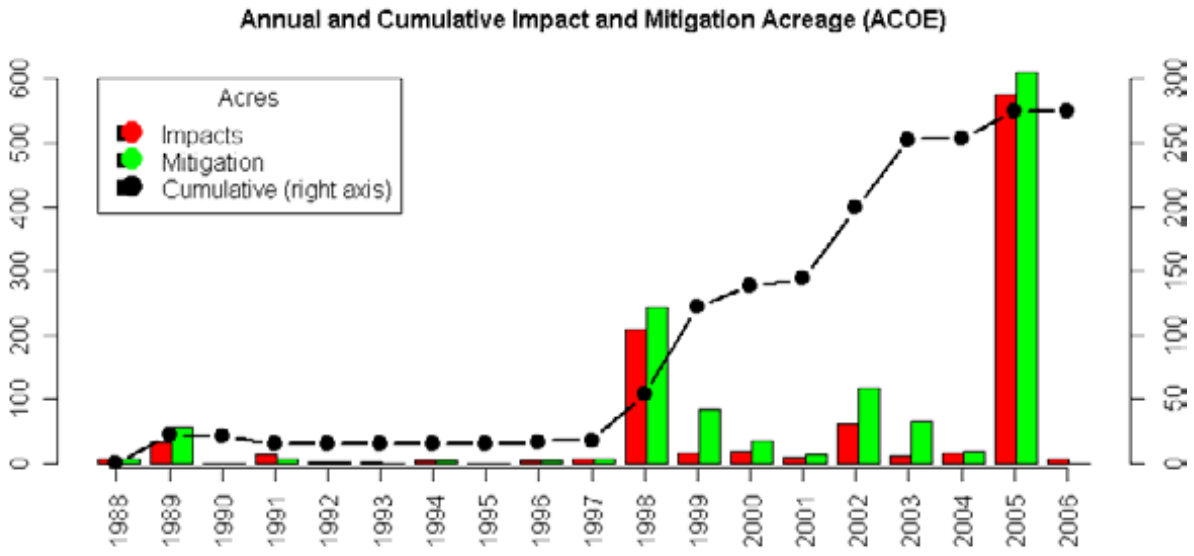


Figure 10. Cumulative Impacts and Mitigation from ACOE Permits

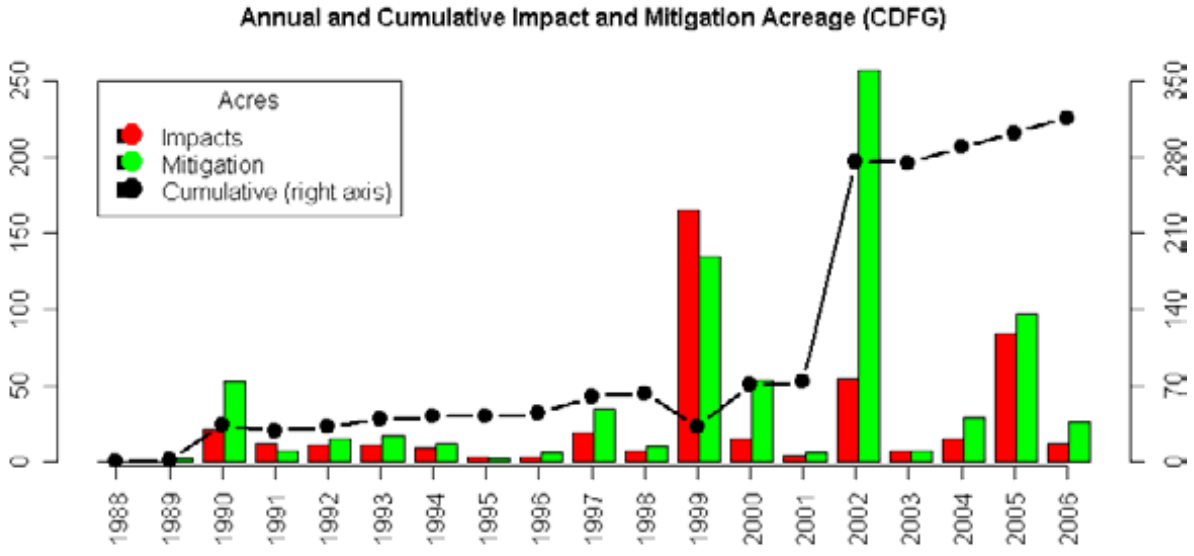
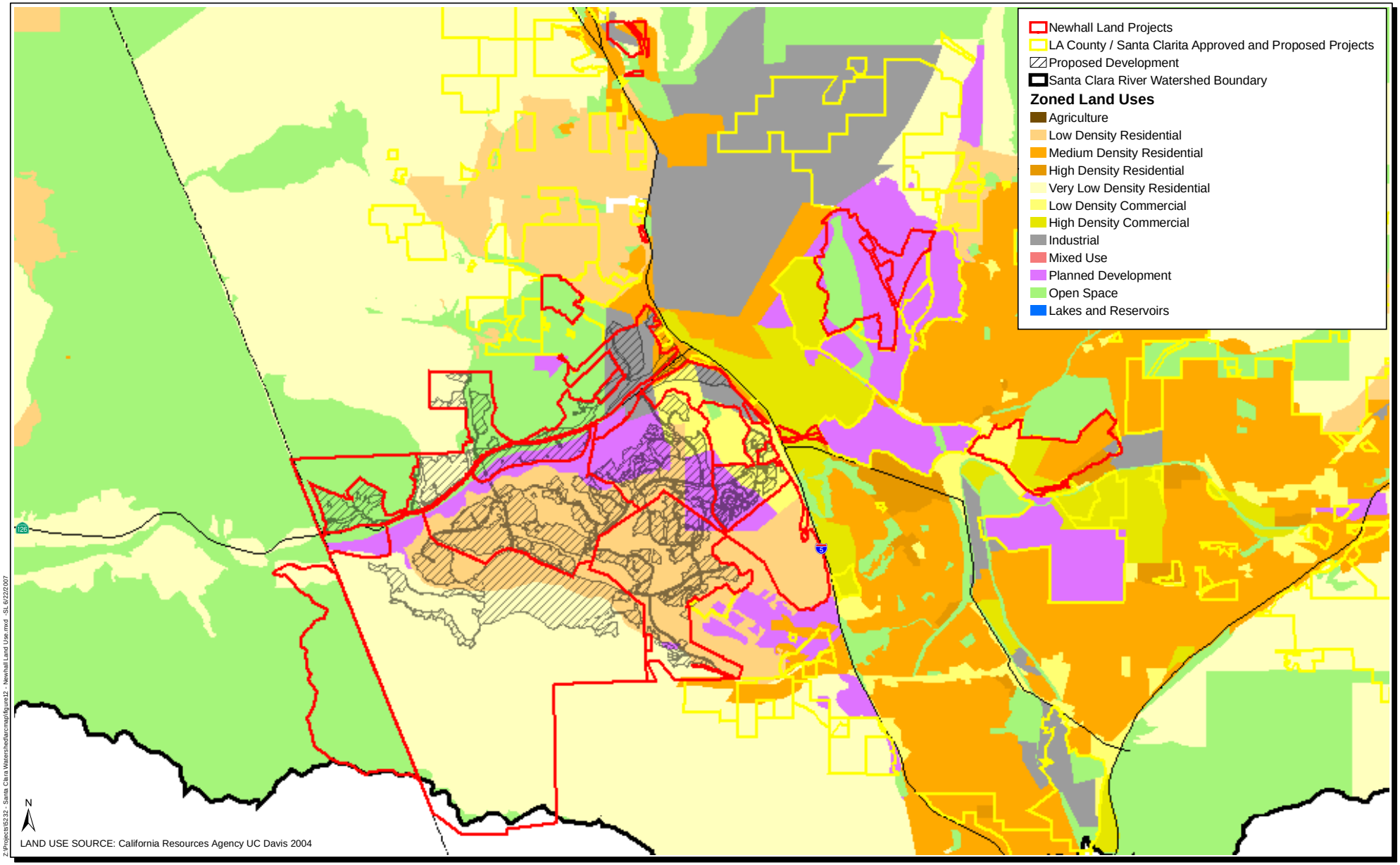


Figure 11. Cumulative Impacts and Mitigation from CDFG Permits



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Newhall Land - Santa Clara River Watershed

Current Land Use Classifications in Relation to Newhall Projects

FIGURE 12

Both the ACOE and CDFG data show that over the past 18 years there has been a substantial cumulative net gain in mitigated acreage over impacts. In other words, based on these data, there should be more jurisdictional wetlands and waters today then there were in 1988 (see Footnote 1); on the order of 275 acres of ACOE jurisdiction and 316 acres of CDFG jurisdiction. The ACOE data show that in all years since 1998 except 2006, where data possibly were incomplete, mitigation exceeded impacts. Data from 1988-1997 were dominated by temporary impacts which were assumed, by definition, to not result in a net loss of wetlands, hence the equivalent values of impacts and mitigation from 1992 to 1997. Data from CDFG permits show that since 1990 mitigation exceeded impacts in every year except 1991, 1995, and 1999 (14 out of 17 years). The trend in the CDFG data is dominated by the extremely high ratio of mitigation to impacts in 2002; however, the trend is still positive excluding 2002.

3.3 Impacts of Planned and Approved Projects in the SCRW

3.3.1 Current Land Use Classifications

Subsection 3.1 summarized existing conditions in the SCRW and the potential for development under the current land use classifications, which showed that 29% of the watershed is classified for some type of development that could influence watershed function, such as by increasing impervious surfaces, increasing perennial flows, disrupting normal fluvial processes, and degrading water quality. This subsection examines the relationship between current land use classifications and actual planned and approved projects.[5] As noted above, however, as specific plans and projects are refined and result in amendments to general plan and classifications, often a reduction in project footprints occurs. Thus, the impact analysis based on current land use classifications is considered a worst-case assessment and is not likely to occur. It is also important to understand that a development land use classification does not mean that the entire areas will become impervious surface with buildout. The development classification only indicates the designation of the area for development and is not equivalent to the amount of impervious surface that would be created if development occurred there.

Table 9 shows the breakout of current land use classifications of Los Angeles and Ventura counties. Based on current land use classifications, Ventura County, which comprises about 52% of the SCRW, is classified for about 107,337 acres of development (20%), substantially less than the 37% of the Los Angeles County portion of the watershed classified for development. As shown in *Figure 3*, the vast majority of the classified development in Ventura County is along the Santa Clara River valley, but with about 10% of the total located in the Stauffer sub-basin in the northwest portion of the watershed. Even though 20% of the SCRW in Ventura County is

[5] Technically, once a project is approved, its "current" classifications is the same as its "approved" classifications. However, the purpose of this analysis is to compare what the watershed buildout would be under the pre-existing classifications to the projected development based on approved projects. For example, on Newhall lands, much less will be developed than would be allowed under current classifications.

classified for development, it is unlikely, due to initiatives such as SOAR, that this percentage of the watershed in Ventura County would be built out.

Table 10 shows the relationship between the current land use classifications in the SCRW and the planned and approved projects for the City of Santa Clarita and Los Angeles County as depicted as an overlay on the land use classifications in *Figure 3*. Compared to the current land use classifications (*Figure 3*), planned and approved projects in the City of Santa Clarita and Los Angeles County comprise 32,260 acres (13%) of the 303,045 acres classified for development in the watershed and only 4.4% of the 1,036,571 acres in the watershed.

TABLE 9
Current Land Use Classifications by County

	County Totals		Land Use Totals		Land Use Percentages	
County	**Acres**	**Percent**	**Classified Developed**	**Open Space**	**Classified Developed**	**Open Space**
Los Angeles	497,815	48.0%	195,708	302,107	39.3%	60.7%
Ventura	536,903	51.8%	107,337	429,566	20.0%	80.0%
Kern	876	0.1%	0	876	0.0%	100.0%
Santa Barbara	973	0.1%	0	973	0.0%	100.0%
Total Watershed	**1,036,567**		**303,045**	**733,522**	**29.2%**	**70.8%**

TABLE 10
Planned and Approved Projects in the City of Santa Clarita and Los Angeles County in Relation to Current Land Use Classifications

		Planned/Approved[a]				
Baseline Land Use Classifications	**Total Acres**	**Santa Clarita**	**Los Angeles County**	**Both[b]**	**Total Acres Planned/ Approved**	**Percent Planned/ Approved**
Low-density commercial	4,335	236	750	0	986	22.8%
High-density commercial	3,911	928	0	0	928	23.7%
Industrial	8,917	363	2,462	0	2,825	31.7%
Very low-density residential	157,488	1,239	15,582	230	17,051	10.8%
Low-density residential	83,826	371	8,723	209	9,303	11.1%
Medium-density residential	29,930	1,067	1,392	2	2,462	8.2%
High-density residential	2,177	65	27	0	93	4.3%
Residential planned development[c]	12,056	2,053	3,324	5	5,382	44.6%
Mixed use	405	0	0	0	0	0.0%
Subtotal – Development	***303,045***	***6,323***	***32,260***	***447***	***39,030***	***12.9%***
Open space	729,430	364	5,697	2	6,062	0.8%
Urban reserve	4,096	0	0	0	0	0.0%
Total	**1,036,571**	**6,686**	**37,957**	**449**	**45,092**	**4.4%**

[a]Newhall lands are included in the Los Angeles County totals.
[b]Land designated as both Santa Clarita and Los Angeles County
[c]Residential planned development is a minimum 5-acre planned unit development with approved CUP

These planned and approved projects data only cover five of the 14 sub-basins in the SCRW because they are limited to Los Angeles County and the City of Santa Clarita. *Table 11* summarizes the acreages and percentages of planned and approved projects in these five sub-basins. Overall, planned and approved projects comprise 9% of the SCRW sub-basins in Los Angeles County, ranging from 2% in the Mint Canyon sub-basin to 13% of the Eastern sub-basin, which includes the City of Santa Clarita. The Eastern sub-basin, which is by far the largest sub-basin in the watershed, contains the largest coverage of planned and approved projects, totaling 37,747 acres. As shown in *Figure 4*, the planned and approved projects are concentrated in the lower elevation portions of the watershed in proximity to existing urban development.

TABLE 11
Planned and Approved Projects in the City of Santa Clarita and Los Angeles County in Relation to Sub-basins

Sub-basin	Total Sub-basin Area	Planned/Approved[a]				
		Santa Clarita	Los Angeles County	Both[b]	Total Acres Planned/ Approved	Percent Planned/ Approved
Acton	88,787	0	2,544	0	2,544	2.9%
Eastern	291,730	6,686	30,612	449	37,747	12.9%
Mint Canyon	10,836	0	230	0	230	2.1%
Santa Felicia	78,066	0	3,836	0	3,836	4.9%
Sierra Pelona	9,677	0	748	0	748	7.7%
Total	**479,096**	**6,686**	**37,971**	**449**	**45,106**	**9.4%**

[a]Newhall lands are included in the Los Angeles County totals.
[b]Land designated as both Santa Clarita and Los Angeles County.

3.3.2 Vegetation

Table 12 summarizes the impacts of planned and approved projects in the City of Santa Clarita and County of Los Angeles on vegetation communities and land cover types. Sixteen of the 40 distinct vegetation and land cover types would be impacted. For the 16 types impacted, development acreages range from 19 acres (<1%) of big sagebrush scrub to 21,000 acres (15%) of Venturan coastal sage scrub. For the major vegetation communities (coastal scrubs, chaparrals, non-native grassland, riparian/wetland, and woodland & forest), coastal scrubs would have the most impacts at 23,443 acres (13%) and riparian/wetland would have the least impacts at 869 acres (6%).

TABLE 12
Planned and Approved Projects in the City of Santa Clarita and Los Angeles County in Relation to Vegetation Communities and Land Cover Types

Vegetation and Land Cover Type	Total Acres	Planned/Approved[a]				
		Santa Clarita	Los Angeles County	Both[b]	Total Planned/ Approved Acres	Percent Planned/ Approved
Big sagebrush scrub	4,996	0	19	0	19	0.4%
Coastal scrubs						
Coastal sage/chaparral scrub	2,452	0	0	0	0	0.0%
Riversidean sage scrub	29,418	164	1,690	213	2,067	7.0%
Southern alluvial fan scrub	5,062	-	365	—	365	7.2%
Venturan coastal sage scrub	144,932	2,256	18,752	3	21,011	14.5%
Subtotal	***181,864***	***2,420***	***20,807***	***216***	***23,443***	***12.9%***
Chaparrals						
Buck brush chaparral	88,367	0	765	0	765	0.9%
Ceanothus crassifolius chaparral	76,116	1,906	756	0	2,662	3.5%
Chamise chaparral	131,091	915	6,211	1	7,127	5.4%
Interior live oak chaparral	73,273	125	2,600	224	2,948	4.0%
Mesic north slope chaparral	1,778	0	0	0	0	0.0%
Mixed montane chaparral	2,676	0	0	0	0	0.0%
Montane ceanothus chaparral	3,582	0	0	0	0	0.0%
Northern mixed chaparral	70,033	0	165	0	165	0.2%
Scrub oak chaparral	67,134	0	203	0	203	0.3%
Semi-desert chaparral	6,695	0	0	0	0	0.0%
Upper Sonoran manzanita chaparral	30,291	0	0	0	0	0.0%
Subtotal	***551,036***	***2,945***	***10,700***	***225***	***13,870***	***2.5%***
Non-native grassland	22,240	—	3,261	—	3,261	14.7%
Riparian/Wetland						
Mulefat scrub	2,587	0	0	0	0	0.0%
Permanently-flooded lacustrine habitat	5,014	0	0	0	0	0.0%
Southern coast live oak riparian forest	1,392	0	0	0	0	0.0%
Southern cottonwood/willow riparian forest	4,641	138	731	0	869	18.7%
Southern sycamore/alder riparian woodland	111	0	0	0	0	0.0%
Southern willow scrub	539	0	0	0	0	0.0%

TABLE 12
Planned and Approved Projects in the City of Santa Clarita and Los Angeles County in Relation to Vegetation Communities and Land Cover Types

Vegetation and Land Cover Type	Total Acres	Planned/Approved[a]				
		Santa Clarita	Los Angeles County	Both[b]	Total Planned/ Approved Acres	Percent Planned/ Approved
Subtotal	***14,284***	***138***	***731***	***0***	***869***	***6.1%***
Woodland & forest						
Bigcone spruce/canyon oak forest	15,974	0	0	0	0	0.0%
Black oak forest	925	0	0	0	0	0.0%
California walnut woodland	3,624	0	0	0	0	0.0%
Canyon live oak forest	1,951	0	0	0	0	0.0%
Interior live oak forest	1,783	0	0	0	0	0.0%
Jeffrey pine forest	10,169	0	0	0	0	0.0%
Jeffrey pine forest/fir forest	5,258	0	0	0	0	0.0%
Mojavean pinyon and juniper woodlands	98,151	0	1,789	0	1,789	1.8%
Sierra mixed conifer forest	5,251	0	0	0	0	0.0%
Westside ponderosa pine forest	10,124	0	0	0	0	0.0%
Subtotal	***153,210***	***0***	***1,789***	***0***	***1,789***	***1.2%***
Other natural land covers						
Bare exposed rock	702	0	0	0	0	0.0%
Sandy area other than beaches	8,191	409	21	0	430	5.3%
Subtotal	***8,893***	***409***	***21***	***0***	***430***	***4.8%***
Agricultural land						
Agricultural land	28,791	0	0	0	0	0.0%
Evergreen orchard	6,236	0	0	0	0	0.0%
Orchard or vineyard	16,676	0	0	0	0	0.0%
Subtotal	***51,703***	***0***	***0***	***0***	***0***	***0.0%***
Developed/disturbed lands						
Open pit mines, quarries, and gravel pits	1,056	—	0	—	0	0.0%
Urban or built-up land	47,286	774	641	8	1,422	3.0%
Subtotal	***48,342***	***774***	***641***	***8***	***1,423***	***2.9%***
Grand Total	**1,036,567**	**6,686**	**37,969**	**449**	**45,104**	**4.4%**

[a]Newhall lands are included in the Los Angeles County totals.
[b]Land designated as both Santa Clarita and Los Angeles County.

3.3.3 Geologic Types

Table 13 summarizes the impacts of planned and approved projects in the City of Santa Clarita and County of Los Angeles on geologic types. Of the 18 geologic types (excluding water) occurring in the SCRW, 14 would be impacted, with a range of 1 acre of granitic and metamorphic rocks to 14,832 acres (11%) of Plio-Pleistocene nonmarine/Pliocene marine. Other geologic types with substantial impact include alluvium (6,544 acres), Miocene marine (3,379 acres), Miocene nonmarine (6,783 acres), Pliocene marine (9,905 acres), and Precambrian rocks (1,068 acres). In terms of percentages, Miocene nonmarine would have the largest impact, with 21% of its total in the watershed developed. All other impacted geologic types would have less than 14% of their totals in the watershed developed.

3.3.4 Soil Types

Table 14 summarizes the impacts of planned and approved projects in the City of Santa Clarita and County of Los Angeles on soil types. Seven of the 27 soil types in the SCRW have planned and permitted project impacts. The soil type impacts are related to the soils distribution (*Figure 6*). The greatest impacts in acreage and percentage would occur to Cieneba-Exchequer-Sobrante soils, at 23,416 acres and 18% of the total of this type in the watershed. At 132,462 acres, this soil type is the second most common (13%) in the watershed. Impacts to other soil types range from 262 acres (<1%) of Lodo-Sobrante-Gaviota to 8,838 acres (7%) of Cieneba-Pismo-Caperton.

3.3.5 Elevations

Table 15 summarizes the impacts of planned and approved projects in the City of Santa Clarita and County of Los Angeles at different elevations and *Figure 7* shows their distribution. Planned and approved projects tend to be located at elevations between 1,000 and 2,000 feet, with this range accounting for 35,158 acres, or 78% of the total development. While 62% of the watershed is below 3,500 feet, 99% of the planned and approved projects are below this elevation. At least based on the City of Santa Clarita and County of Los Angeles information, only 101 acres would be developed above 4,000 feet and no development is planned or approved for elevations above 4,500 feet.

TABLE 13
Planned and Approved Projects in the City of Santa Clarita and Los Angeles County in Relation to Geologic Types

Geologic Type	Total Acres	Planned/Approved[a]				
		Santa Clarita	Los Angeles County	Both[b]	Total Planned/ Approved Acres	Percent Planned/ Approved
Alluvium (Quaternary nonmarine & marine)	84,305	1,544	4,992	8	6,544	7.8%
Eocene marine	155,991	0	0	0	0	0.0%
Granitic and metamorphic rocks (pre-Cenozoic age)	3,666	0	1	0	1	0.0%
Mesozoic granitic rocks	98,814	0	1,093	0	1,093	1.1%
Miocene marine	123,761	0	3,379	0	3,379	2.7%
Miocene nonmarine	32,575	1,534	4,991	213	6,738	20.7%
Oligocene marine	3,508	0	0	0	0	0.0%
Oligocene nonmarine	57,235	0	213	0	213	0.4%
Paleocene marine	22,989	0	0	0	0	0.0%
Paleozoic and Permo-Triassic granitic rocks	16,422	0	21	0	21	0.1%
Pliocene marine	73,392	505	9,370	30	9,905	13.5%
Plio-Pleistocene nonmarine, Pliocene nonmarine	135,755	3,101	11,533	198	14,832	10.9%
Precambrian granitic rocks	38,984	3	452	0	455	1.2%
Precambrian rocks, undivided	117,724	0	1,068	0	1,068	0.9%
Schist (metasedimentary or metavolcanic)	38,909	0	301	0	301	0.8%
Tertiary nonmarine, undivided	12,487	0	108	0	108	0.9%
Tertiary volcanic flow rocks	12,286	0	449	0	449	3.7%
Upper Cretaceous marine	5,705	0	0	0	0	0.0%
Water	2,057	0	0	0	0	0.0%
Total	**1,036,566**	**6,687**	**37,970**	**449**	**45,107**	**4.4%**

[a]Newhall lands are included in the Los Angeles County totals.
[b]Land designated as both Santa Clarita and Los Angeles County.

TABLE 14
Planned and Approved Projects in the City of Santa Clarita and Los Angeles County in Relation to Soil Types

Soil Type	Total Soil Acres	Planned/Approved[a]				
		Santa Clarita	Los Angeles County	Both[b]	Total Planned/ Approved Acres	Percent Planned/ Approved
Millerton-Lodo-Millsholm	153,429	0	0	0	0	0.0%
Cieneba-Exchequer-Sobrante	132,462	3,781	19,429	206	23,416	17.7%
Cieneba-Pismo-Caperton	129,534	764	7,889	185	8,838	6.8%
San Benito-Castaic-Calleguas	99,503	0	2,582	0	2,582	2.6%
Los Gatos-Gamboa-Hilt	90,317	0	0	0	0	0.0%
Pico-Anacapa-Salinas	84,613	2,142	5,676	31	7,849	9.3%
Cieneba-Caperton-Gaviota	81,270	0	0	0	0	0.0%
Aramburu Variant-Modjeska Family-Coarsegold	51,392	0	0	0	0	0.0%
Hilt-Arrastre-Marpa	42,864	0	0	0	0	0.0%
Gorman-Oak Glen-Gaviota	36,698	0	0	0	0	0.0%
Lodo-Sobrante-Gaviota	36,345	0	262	0	262	0.7%
Badland-Calleguas-Lithic Xerorthents	18,993	0	1,757	27	1,784	9.4%
Rock Outcrop-Chilao-Stonyford	17,800	0	0	0	0	0.0%
Soboba-Avawatz-Oak Glen	9,296	0	375	0	375	4.0%
(No Data)	8,757	0	0	0	0	0.0%
Sespe-Lodo-Malibu	8,086	0	0	0	0	0.0%
Oak Glen-Xerofluvents-Dotta	6,564	0	0	0	0	0.0%
Cieneba-Andregg-Vista	5,582	0	0	0	0	0.0%
San Andreas-Arnold-Arujo	5,518	0	0	0	0	0.0%
Soper-Chesterton-Rincon	4,443	0	0	0	0	0.0%
Hambright-Lithic Xerorthents-Rock Outcrop	3,510	0	0	0	0	0.0%
Walong-Edmundston-Rock Outcrop	2,853	0	0	0	0	0.0%
Beam-Kilmer-Badland	2,354	0	0	0	0	0.0%
Glean-Mahogan-Metz	1,948	0	0	0	0	0.0%
Tollhouse-Rock Outcrop-Bakeoven	1,074	0	0	0	0	0.0%
Arbuckle-San Ysidro-Positas	883	0	0	0	0	0.0%
Oceano-Baywood-Dune Land	374	0	0	0	0	0.0%
Camarillo-Hueneme-Pacheco	74	0	0	0	0	0.0%
Total	**1,036,534**	**6686.7**	**37,970**	**449**	**45,106**	**4.4%**

[a]Newhall lands are included in the Los Angeles County totals.
[b]Land designated as both Santa Clarita and Los Angeles County.

TABLE 15
Planned and Approved Projects in the City of Santa Clarita and Los Angeles County in Relation to Elevations

Elevation (feet)	Total Acres	Planned/Approved[a]				
		Santa Clarita	Los Angeles County	Both[b]	Total Planned/ Approved Acres	Percent Planned/ Approved
0–500	48,058	0	0	0	0	0%
500–1000	52,187	0	2,483	0	2,483	4.8%
1001–1500	95,436	3,684	15,576	167	19,427	20.4%
1501–2000	108,424	2,530	13,041	160	15,731	14.5%
2001–2500	86,661	473	2,901	123	3,496	4.0%
2501–3000	116,903	0	1,584	0	1,584	1.4%
3001–3500	135,348	0	1,761	0	1,761	1.3%
3501–4000	104,922	0	520	0	520	0.5%
4001–4500	75,120	0	101	0	101	0.1%
4501–5000	66,875	0	0	0	0	0%
5001–5500	68,878	0	0	0	0	0%
5501–6000	38,010	0	0	0	0	0%
6001–6500	20,474	0	0	0	0	0%
6501–7000	9,554	0	0	0	0	0%
7001–7500	5,206	0	0	0	0	0%
7501–8000	2,688	0	0	0	0	0%
>8000	1,550	0	0	0	0	0%
Total	**1,036,292**	**6,687**	**37,967**	**449**	**45,103**	**4.4%**

[a]Newhall lands are included in the Los Angeles County totals.
[b]Land designated as both Santa Clarita and Los Angeles County.

3.3.6 Slopes

Table 16 summarizes the impacts of planned and approved projects in the City of Santa Clarita and County of Los Angeles at slopes in 20% increment intervals and *Figure 8* shows their distribution. While lands with slopes less than 20% account for about 70% of the land in the watershed, 93% of all planned and permitted projects would be built on these lands.

TABLE 16
Planned and Approved Projects in the City of Santa Clarita and Los Angeles County in Relation to Slopes

Slope	Total Acres	Planned/Approved[a]				
		Santa Clarita	Los Angeles County	Both[b]	Total Planned/ Approved Acres	Percent Planned/ Approved
0-20%	723,464	6,645	34,779	446	41,870	11.6%
21-40%	302,688	41	3,192	3	3,236	1.7%
>40%	9,225	0	0	0	0	0.0%
Total	**1,035,377**	**6,686**	**37,971**	**449**	**45,106**	**4.4%**

[a]Newhall lands are included in the Los Angeles County totals.
[b]Land designated as both Santa Clarita and Los Angeles County.

3.4 Analysis of Newhall Land Project Area

The previous section summarized the impacts of planned and approved projects in the City of Santa Clarita and the County of Los Angeles on the SCRW watershed in relation to current land use classifications, vegetation community and land cover types, geology, soils, elevations and slopes. This section analyzes the proposed impacts of Newhall projects within this same context.

As shown in *Figure 2*, Newhall's land holdings comprise a relatively small and localized portion of the SCRW, totaling about 18,665 acres (1.8%) of the total watershed located in the Eastern and Santa Felicia sub-basins. *Figure 2* also shows that Newhall's lands are in the lower portions of the watershed in areas that drain directly into the Santa Clara River. Overall, of the 18,665 acres of Newhall lands, 11,087 acres (59%) would be developed and 7,577 acres (41%) would be in open space (*Table 15*). The 11,087 acres of development comprises 1% of the SCRW. The 7,577 acres of open space includes High Country SMA (3,942 acres), Salt Creek Area (1,516 acres), the River Corridor (977 acres), Other Open Area (1,002 acres), and a Conservation Easement area (139 acres).

3.4.1 Current Land Use Classifications

Table 17 summarizes the relationship between Newhall land development and current land use classifications and *Figure 12* shows the distribution of Newhall development and open space in relation to land use classifications. For example, under current land use classifications, there are 725 acres of low-density commercial classified for Newhall lands, of which Newhall would develop 678 acres (94%) and maintain 46 acres in open space.

TABLE 17
Planned Development on Newhall Lands in Relation to Current Land Use Classifications

Current Land Use Classifications	Total Watershed Acres	Newhall Lands					
		Total Acres	Acres Preserved	Acres Developed	Percent of Total Developed	Percent Total Watershed Area Preserved	Percent Total Watershed Area Developed
Low-density commercial	4,335	725	46	678	94%	1.1%	15.6%
High-density commercial	3,911	0	0	0	NA	0.0%	0.0%
Industrial	8,917	627	46	581	93%	0.5%	2.8%
Very low-density residential	157,488	6,159	4,283	1,875	30%	2.7%	1.2%
Low-density residential	83,826	4,967	655	4,312	87%	0.8%	5.1%
Medium-density residential	29,930	211	0	211	100%	0.0%	0.7%
High-density residential	2,177	0	0	0	NA	0.0%	0.0%
Mixed use	405	0	0	0	NA	0.0%	0.0%
Residential planned development	12,057	2,342	690	1,651	71%	5.7%	13.7%
Total developed	***303,046***	***15,029***	***5,721***	***9,309***	***62%***	***1.9%***	***3.1%***
Open space	729,430	3,635	1,857	1,779	49%	0.3%	0.2%
Urban reserve	4,096	0	0	0	NA	0.0%	0.0%
Total open space	***733,526***	***3,635***	***1,857***	***1,779***	*49%*	*0.3%*	*0.2%*
Grand Total	**1,036,572**	**18,665**	**7,577**	**11,087**	**59%**	**0.7%**	**1.0%**

Several key differences between Newhall development and current land classifications are apparent in *Table 17*.

- The footprint of Newhall development is consistent with current land use classifications for commercial, industrial, low-density residential and medium-density residential. As shown in *Figure 12*, these classifications in relation to Newhall development area concentrated in the area just west of I-5 and south of SR-126 and are contiguous with existing development.

- Development in areas classified as very low residential would be reduced on Newhall lands by 70%. Substantial area in the southern part of the watershed classified as very low-density residential would be in the High Country SMA.

- About 62% of lands classified for some type of development would be developed on Newhall lands.

- About 49% of lands classified for open space would be developed on Newhall lands, primarily north of SR-126.

- Under current classifications, 15,029 acres could be developed. A total of 11,087 acres (74%) would be developed on Newhall lands.

Table 17 also shows the percentages of the different land use classifications in the SCRW that would be developed on Newhall lands. For example, about 16% of all lands in the watershed classified for low-density commercial would be on Newhall lands. These percentages demonstrate that Newhall development accounts for a very small percentage of development in relation to the classified development in the watershed. Other than lower-density commercial and residential planned development (14%), Newhall development is a very small fraction of the classified development in the watershed, ranging from <1% of medium-density residential to 5% of low-density residential. Overall, development on Newhall lands accounts for 3% of the total classified development in the watershed. With regard to the entire SCRW, development of Newhall lands would impact only 1% of the total watershed.

3.4.2 Sub-basins

The previous subsection discussed the relationship between development on Newhall lands and the entire SCRW and land use classifications within the watershed and on Newhall lands. *Table 18* shows development on Newhall lands in the two sub-basins within the SCRW in order to examine the impacts of development at the sub-basin level. As shown in *Table 1* and *Figure 2* and discussed in *Subsection 3.1.1*, the Eastern sub-basin, at 292,730 acres and 28% of the total watershed, is by far the largest sub-basin in the watershed and has experienced the largest amount of land conversion from development in Valencia and Santa Clarita along the I-5 corridor. Under current land use classifications, 131,630 acres (45%) of the Eastern sub-basin could be developed (see *Figure 3*). The Santa Felicia sub-basin, at 78,066 acres, is a moderate-sized sub-basin that accounts for about 7% of the watershed (*Table 1* and *Figure 2*). Most of the current land conversion is from agriculture in the valley adjacent to the Santa Clara River. Under current land use classifications, about 29,994 acres (38%) could be developed (see *Figure 3*).

Newhall lands account for about 5% of the Eastern sub-basin and 7% of the Santa Felicia sub-basin (*Table 18*). Overall, 98% of the Newhall planned development is in the Eastern sub-basin, accounting for 81% of the Newhall lands in the sub-basin. In contrast, development of Newhall land in the Santa Felicia sub-basin would only be 4% of the total.

In the context of the entire sub-basins, Newhall development would impact about 4% of the Eastern sub-basin and only 0.3% of the Santa Felicia sub-basin. Combined, development on Newhall lands in the two sub-basins accounts for 3%. As discussed above, development on Newhall lands would occur in the lower portions of these two sub-basins.

TABLE 18
Planned Development on Newhall Lands in Relation to Sub-basins

Sub-basin	Sub-basin Acres	Newhall Lands				
		Newhall Acres	Acres Preserved	Acres Developed	Percent of Newhall Land in Sub-basin Developed	Percent of Overall Sub-basin Developed
Eastern	291,730	13,334	2,485	10,850	81%	3.7%
Santa Felicia	78,066	5,329	5,093	236	4%	0.3%
Total	**369,796**	**18,663**	**7,577**	**11,086**	**59%**	**3.0%**

3.4.3 Vegetation Communities

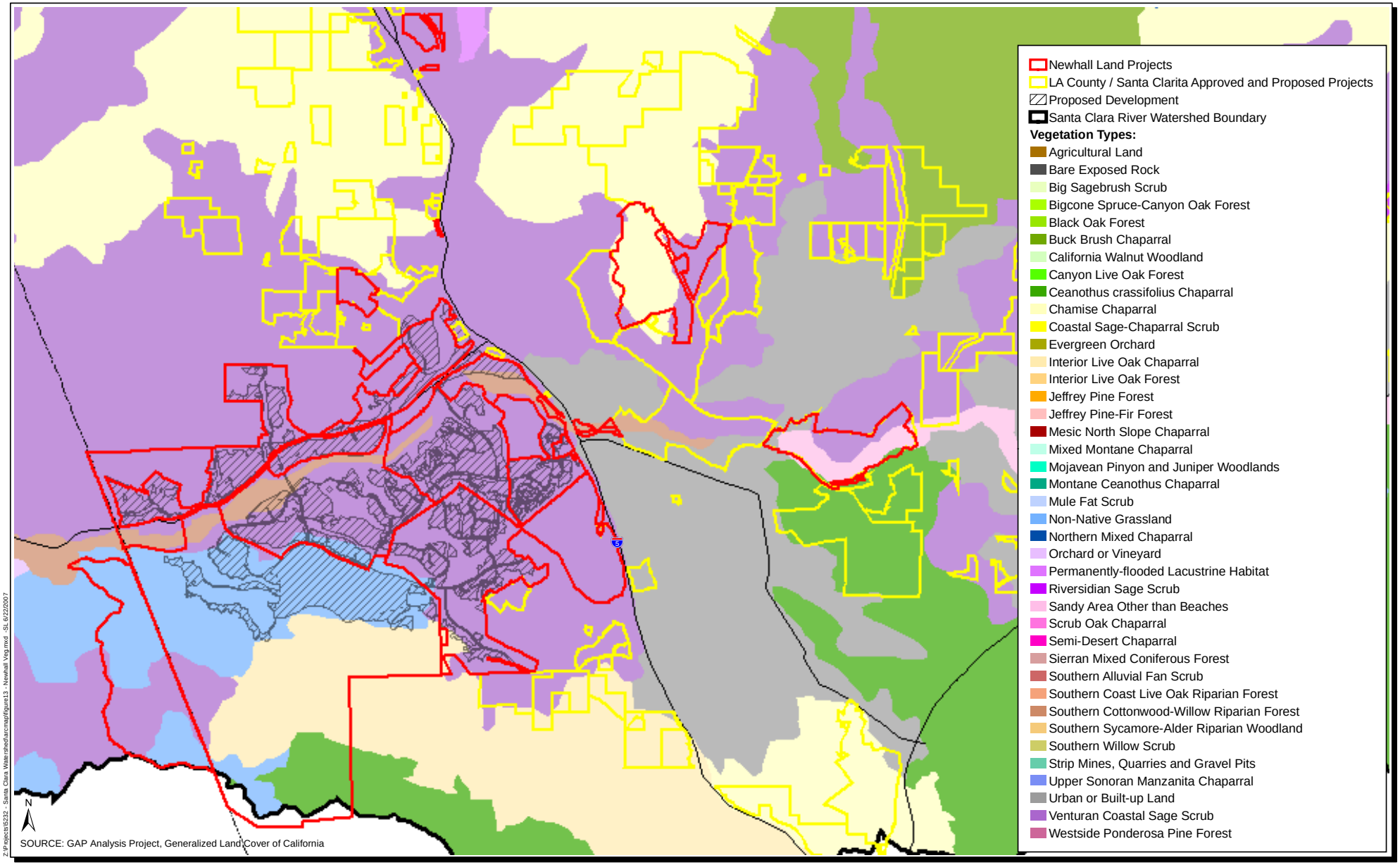
Table 19 summarizes planned development of vegetation communities and *Figure 13* shows their distribution in relation to their occurrence on Newhall lands and within the entire SCRW. According to the California GAP Analysis Project data (1999), Newhall lands are comprised of four general vegetation types – coastal sage scrub, chaparral, non-native grassland, and southern cottonwood-willow riparian forest – with the chaparral comprised of *Ceanothus crassifolius* chaparral and interior live oak chaparral.[6]

Overall, 59% of the vegetation communities on Newhall land are planned for development. Planned development on Newhall lands would impact Venturan coastal sage scrub the greatest extent, both in terms of acreage (7,964 acres) and percent of the total (78%). Interior live oak chaparral would have the smallest percentage impacted, at 16%, and southern cottonwood-willow riparian forest would have the smallest acreage impacted, at 250 acres.

TABLE 19
Planned Development on Newhall Lands in Relation to Vegetation Communities

Vegetation Type	Total Watershed Acres	Newhall Lands				
		Newhall Acres	Acres Preserved	Acres Developed	Percent on Newhall Land Developed	Percent of Overall Watershed Developed
Venturan coastal sage scrub	144,932	10,189	2,225	7,964	78.2%	5.5%
Ceanothus crassifolius chaparral	76,116	1,213	602	611	50.4%	0.8%
Interior live oak chaparral	73,273	2,322	1,952	370	15.9%	0.5%
Non-native grassland	22,240	4,200	2,312	1,888	45.0%	8.5%
Southern cottonwood/ willow riparian forest	4,641	737	487	250	34.0%	5.4%
Total	**321,202**	**18,661**	**7,577**	**11,084**	**59.4%**	**3.5%**

[6] It is important to note that the California GAP Analysis Project data are based on a generalized vegetation database from 1999 and is different from the project-level mapping conducted on Newhall lands over the past few years that includes substantial areas of agriculture, disturbed lands and developed lands. However, for comparative purposes, the watershed-scale analysis must rely on the GAP data.



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Exsiting Vegetation Types in Relation to Newhall Projects

FIGURE 13

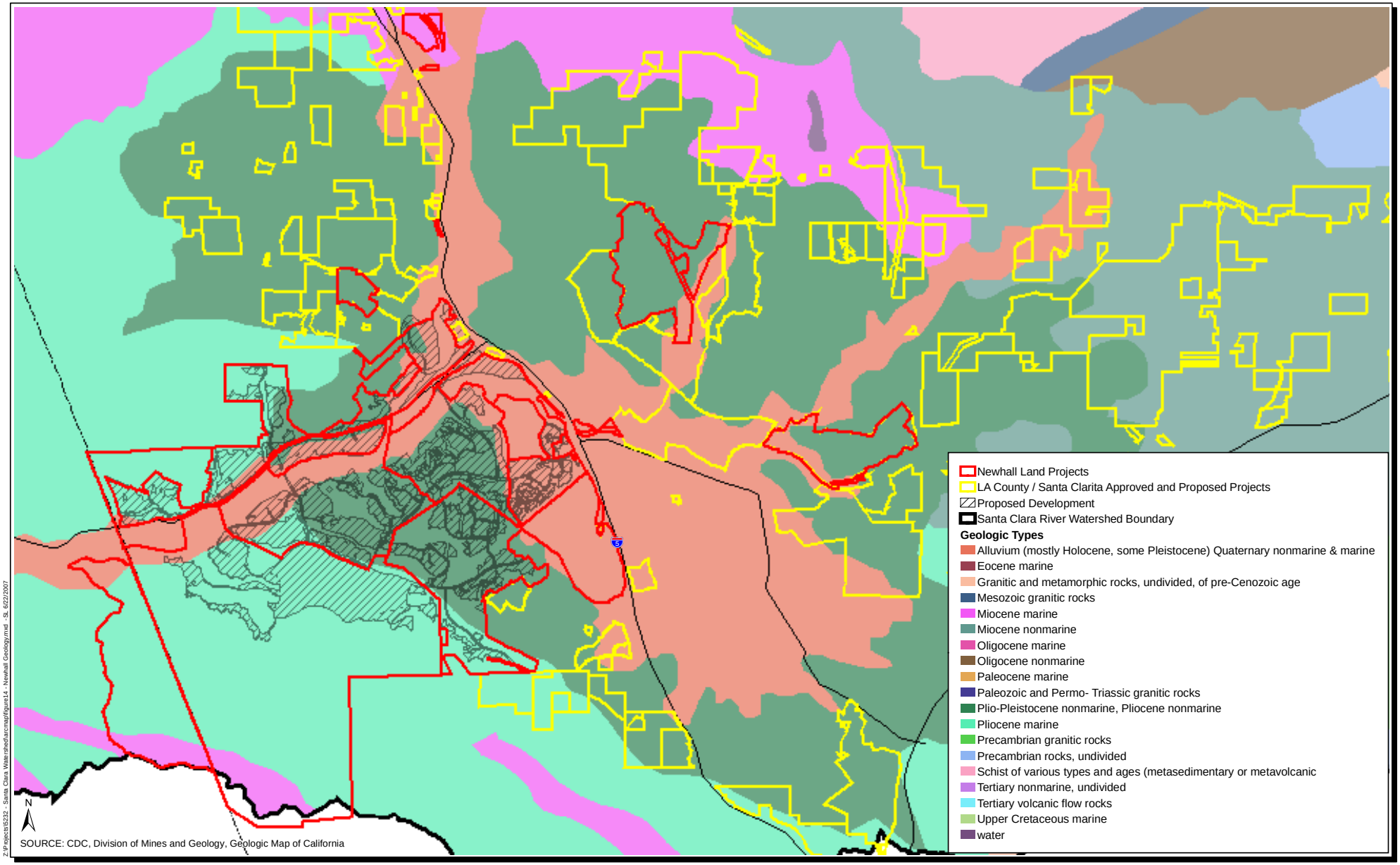
Planned development on Newhall lands would impact relatively small amounts of these vegetation communities in the SCRW, ranging from <1% of the chaparrals to 8.5% of the non-native grassland. It is important to understand the context of these impacts. There are 40 distinct vegetation communities and land cover types in the watershed and Newhall projects would impact only five of the 40 types. Also, with regard to Venturan coastal sage scrub, if the other coastal scrubs (see *Table 2*) are included in the baseline for impacts to coastal scrubs, Newhall projects would impact 4% of the scrubs in the watershed.

3.4.4 Geologic Types

Table 20 summarizes planned development of geologic types and *Figure 14* shows their distribution in relation to their occurrence on Newhall lands and within the entire SCRW. Newhall lands occur on four geologic types of the 19 types that occur in the watershed, of which three types comprise 96% of the total – alluvium, Pliocene marine, and Plio-Pleistocene nonmarine/Pliocene nonmarine. Two of the four types will be heavily impacted – 92% of plio-Pleistocene nonmarine/Pliocene nonmarine and 71% of alluvium. Relative to their occurrence in the SCRW, however, small percentages would be impacted, ranging from 0.1% of Miocene marine to 5% of Pliocene marine.

TABLE 20
Planned Development on Newhall Lands in Relation to Geologic Types

Geologic type	Total Watershed Acres	Newhall Lands				
		Newhall Acres	Acres Preserved	Acres Developed	Percent on Newhall Land Developed	Percent of Overall Watershed Developed
Alluvium (mostly Quaternary)	84,305	4,293	1,259	3,034	70.7%	3.6%
Miocene marine	123,761	766	653	113	14.8%	0.1%
Pliocene marine	73,392	8,931	5,299	3,632	40.7%	4.9%
Plio-Pleistocene nonmarine, Pliocene nonmarine	135,755	4,670	367	4,303	92.1%	3.2%
Total	**417,213**	**18,660**	**7,577**	**11,083**	**59.4%**	**2.7%**



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Existing Geologic Types in Relation to Newhall Projects

FIGURE 14

3.4.5 Soil Types

Table 21 summarizes planned development of soil types and *Figure 15* shows their distribution in relation to their occurrence on Newhall lands and within the entire SCRW. Newhall lands occur on five soil types within the SCRW and development would occur on four of the five types. Almost all (95%) development would occur on two soil types: Cieneba-Exchequer-Sobrante and Pico-Anacapa-Salinas. These two soil types account for 13% and 8% of the total in watershed, respectively. The majority of these soil types on Newhall lands would be developed 2% of Cieneba-Exchequer-Sobrante and 78% of Pico-Anacapa-Salinas. Relatively small percentages of the other two impacted soils would be developed; 5% of Badlands-Calleguas-Lithic Xerorthents and 15% of San Benito-Castaic-Calleguas. Overall development of these soil types in the watershed would be relatively small, ranging from <1% for Badland-Calleguas-Lithic Xerorthents and San Benito-Castaic-Calleguas to 5% for Cieneba-Exchequer-Sobrante.

3.4.6 Elevations

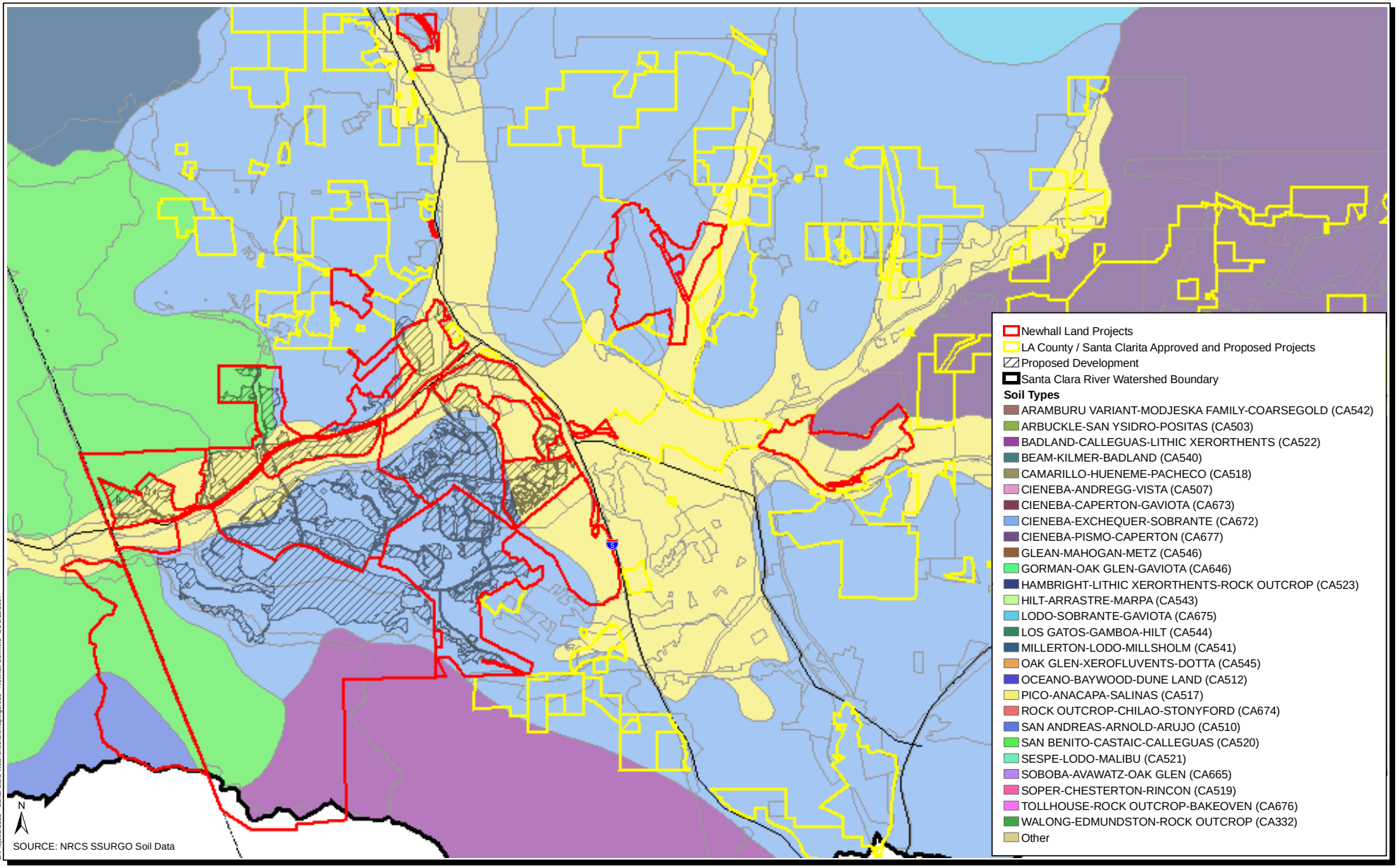
Table 22 summarizes planned development of different elevations and *Figure 16* shows their distribution in relation to their occurrence on Newhall lands and within the entire SCRW. Newhall lands occur on elevations ranging from 500 to 3,500 feet. No development would occur at elevations greater than 2,000 feet. Preserved lands greater than 1,500 feet include the Salt Creek Area and High Country SMA. About 48% of lands at less than 1,000 feet would be developed. A large portion of preserved lands less than 1,000 feet is dominated by the River Corridor preserve area. Most of the development (78%) on Newhall land would be at elevations between 1,000 and 1,500 feet, with 11% of development occurring at less than 1,000 feet and 10% at elevations between 1,500 and 2,000 feet. In relation to elevations in the overall watershed, development would range from 1% of elevations between 1,500 and 2,000 feet to 9% of elevations between 1,000 and 1,500 feet.

TABLE 21
Planned Development on Newhall Lands in Relation to Soils

Soil Type	Total Watershed Acres	Newhall Lands				
		Newhall Acres	Acres Preserved	Acres Developed	Percent on Newhall Land Developed	Percent of Overall Watershed Developed
Badland-Calleguas-Lithic Xerorthents	18,993	1,707	1,625	81	4.8%	0.4%
Cieneba-Exchequer-Sobrante	132,462	8,578	1,540	7,037	82.0%	5.3%
Pico-Anacapa-Salinas	84613	4,436	982	3,454	77.9%	4.1%
San Andreas-Arnold-Arujo	5518	607	607	0	0.0%	0.0%
San Benito-Castaic-Calleguas	99503	3,335	2,823	512	15.4%	0.5%
Total	**341,089**	**18,662**	**7,577**	**11,085**	**59.4%**	**3.2%**

TABLE 22
Planned Development on Newhall Lands in Relation to Elevations

Elevation (feet)	Total Watershed Acres	Newhall Lands				
		Newhall Acres	Acres Preserved	Acres Developed	Percent on Newhall Lands Developed	Percent of Overall Watershed Developed
500–1000	52,187	2,630	1,371	1,259	47.9%	2.4%
1001–1500	95,436	11,244	2,580	8,663	77.1%	9.1%
1501–2000	108,424	3,152	1,991	1,161	36.8%	1.1%
2001–2500	86,661	986	986	0	0.0%	0.0%
2501–3000	116,903	618	618	0	0.0%	0.0%
3001–3500	135,348	32	32	0	0.0%	0.0%
Total	**594,959**	**18,661**	**7,577**	**11,084**	**59.4%**	**1.9%**



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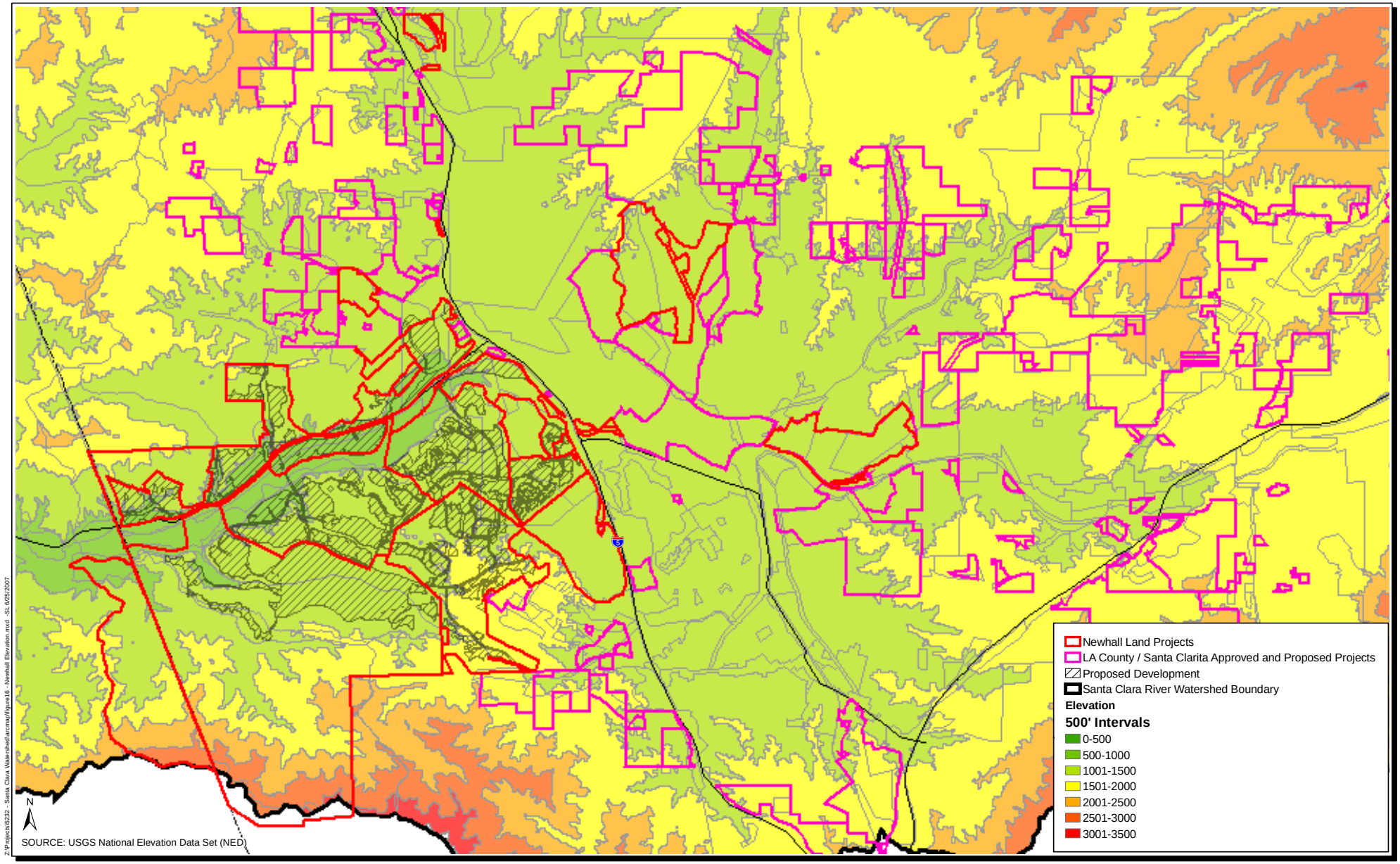
Existing Soil Types in Relation to Newhall Projects

FIGURE 15



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Elevations in Relation to Newhall Projects

FIGURE
16

3.4.7 Slopes

Table 23 summarizes planned development in relation to slopes and *Figure 17* shows their distribution in relation to their occurrence on Newhall lands and within the entire SCRW. Almost all (97%) of Newhall project development is on slopes less than 20%. Very little development would occur slopes between 20% and 40% and no Newhall land occurs on mapped slopes greater than 40%. Watershed-wide, about 1.5% of slopes up to 20% would be developed by Newhall projects and only 0.1% of slopes greater than 20% in the watershed would be developed by Newhall projects.

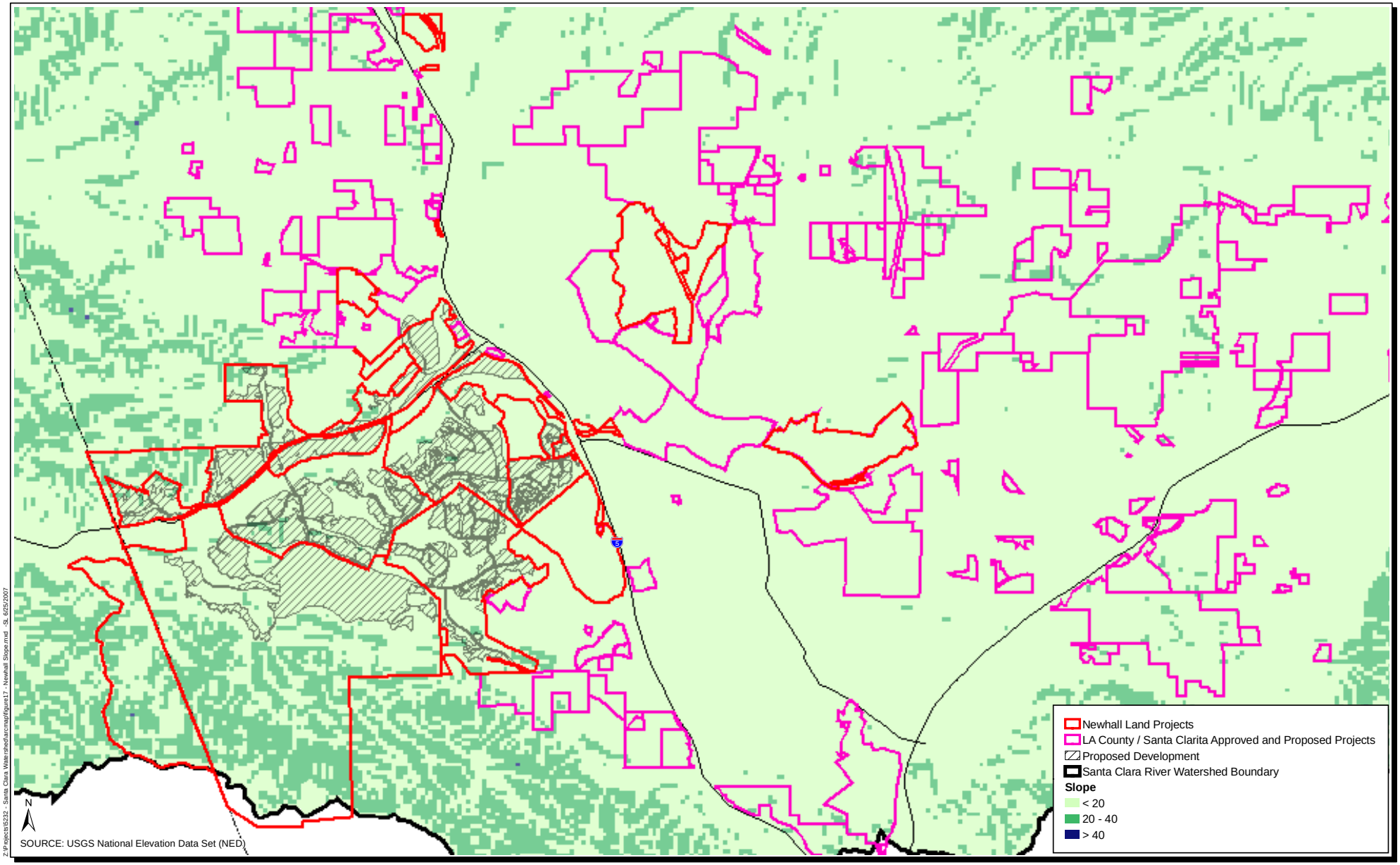
TABLE 23
Planned Development on Newhall Lands in Relation to Slopes

Slope	Total Watershed Acres	Newhall Lands				
		Newhall Acres	Acres Preserved	Acres Developed	Percent of Newhall Land Developed	Percent of Overall Watershed Developed
0-20%	723,464	15,833	5,097	10,736	67.8%	1.5%
21-40%	302,688	2,822	2,475	347	12.3%	0.1%
Total	**1,026,152**	**18,655**	**7,572**	**11,083**	**59.4%**	**1.1%**

3.4.8 CNDDB Elements

One of the vegetation types that occur on Newhall lands, Southern Cottonwood-Willow Riparian Forest, is sensitive according to CNDDB (2006). Current Newhall plans protect 487 acres of this habitat within the River Corridor preserve area, or 10.5% of the total area of this habitat in the SCRW. This area also includes the one element occurrence (EO)[7] for the endangered unarmored three-spine stickleback within the River Corridor (*Table 24*). There are seven additional EOs on Newhall lands. Five of these are for the San Fernando Valley spineflower (SFVS) of which four are within the five spineflower conservation easement areas proposed and designed on Newhall land (Dudek 2006). The fifth EO for SFVS is in the VCC development area. The final CNDDB EO on Newhall land is for Nevin's barberry and occurs in the West Creek Development area. This occurrence is classified as potentially extirpated by CNDDB (2006).

[7] An element occurrence or EO is an observed record for a plant, animal, or habitat type included in the CNDDB Rarefind database.



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Slopes in Relation to Newhall Projects

FIGURE 17

TABLE 24
CNDDB Element Occurrences on Newhall Lands

Species	Baseline Designated Land Use	Newhall Land Use Area
Unarmored three-spine stickleback	Planned development	River Corridor
San Fernando Valley spineflower	Low-density residential	Conservation Easement
San Fernando Valley spineflower	Open space	Conservation Easement
San Fernando Valley spineflower	Low-density commercial	Conservation Easement
San Fernando Valley spineflower	Low-density commercial	Conservation Easement
San Fernando Valley spineflower	Industrial	VCC
Least Bell's vireo	Industrial	VCC
Nevin's barberry	Planned development	West Creek

3.4.9 Wildlife Corridors and Habitat Linkages

The Santa Clara River Corridor is identified as an important regional habitat linkage and wildlife corridor in the *Missing Linkages: Restoring Connectivity to the California Landscape* (Penrod 2000) report and the *South Coast Missing Linkages Project: A Linkage Design for the Santa Monica-Sierra Madre Connection* (Penrod et al. 2006).[8]

The Newhall Ranch Resources Management and Development Plan (RMDP) (Dudek 2007) addresses preservation along the Santa Clara River Corridor. Within and beyond the Newhall boundary, the River Corridor is a regionally-significant riparian and wetland resource, including its function as wildlife corridor and habitat linkage, as well as "live-in" and breeding habitat for a number of federally- and/or state-listed species such as least Bell's vireo, southwestern willow flycatcher, arroyo toad, and unarmored threespine stickleback. From its origin in the San Gabriel Mountains, it extends approximately 80 miles to the west, where it empties into the Pacific Ocean. It is an important migration and possibly genetic dispersion corridor for wildlife and plant species, including obligate aquatic and riparian species and larger more mobile terrestrial species. The River Corridor also comprises a portion of the County of Los Angeles Significant Ecological Area (SEA) 23. As part of the development of the Newhall Ranch Specific Plan, a River Corridor Special Management Area (SMA) has been delineated that is sufficiently wide to accommodate flood events while retaining nearly all of the existing riparian vegetation along the River Corridor. To control human activities that could adversely affect the river as a wildlife corridor and habitat linkage, the RMDP also provides for "transition" areas between the River Corridor SMA and development, restricts recreational uses of the river and provides for long-term management of the River Corridor.

[8] The South Coast Missing Linkages Project is produced by South Coast Wildlands, a non-profit organization that brings together various agencies, scientists and consultants to address conservation issues in the south coast ecoregion.

South Coast Missing Linkages Project (Penrod et al. 2006; SCMLP) identifies 15 priority linkages in the South Coast Ecoregion (shown in Figure 2 of the SCMLP report). Two of these linkages comprise the Santa Monica-Sierra Madre connection, of which the northerly connection crosses a portion of Newhall Ranch at its western boundary on the Ventura/Los Angeles County line.

For the purpose of identifying suitable linkages, SCMLP went through four steps:

1. A "Landscape Permeability Analysis" was conducted. This is a model of relative cost for species to move between large core habitat areas based on how the species is affected by habitat characteristics such as slope, elevation, vegetation, and road density. For example, the cost of mountain lions moving through areas with a dense road network is relatively high because of the risk or vehicle collisions. Similarly, moving across steep slopes may be metabolically costly because of the extra physical effort. Because this model requires detailed species-specific natural history and behavior data, only three species met the criteria for modeling: mountain lion, mule deer, and badger. However, because these species require very large landscape areas, and because together use a broad range of habitats (i.e., riparian, woodlands and forest, shrublands, and grasslands), linkages that function well for these species presumably would function well for many other species; i.e., planning for these species provides an "umbrella" for other species. Exceptions would be species that have unique or narrow habitat requirements that may not be covered by linkages and corridors that work for these three species, such as fish that require purely aquatic habitats or species that are highly vulnerable to, or inhibited by, roads.

   Based on the model results, the least-cost corridor (LCC) was identified as the area modeled to include the top 1% of the least cost-corridor function for each of the three species.[9] The least-cost corridor output was combined to generate the least cost union (LCU), which is defined by the SCMLP as "the zone within which all three modeled species would encounter the least energy expenditure (i.e., preferred travel route) and most favorable habitat as they move between targeted protected areas (p. 12)." It should be noted, however, that this output did not include other factors that could affect movement that were not in the input variables; e.g., barriers, mortality risks, dispersal limitations, etc.

2. A patch size and configuration analysis was conducted to determine whether suitable habitat within the LCU zone is large enough to support viable populations and patches

[9] The least-cost corridor (LCC) function is a GIS-based analytic technique that "evaluates the "cost" of moving between two designated source areas by calculating for each cell [in a grid], the cumulative weighted distance between the cell and the two sources. The least-cost corridor analysis results in a map that shows the relative linkage value across the landscape (which routes through the landscape encounter more or fewer landscape barriers) between the two source areas." (Singleton et al. 2002, p. 6)

were close enough to allow for inter-patch dispersal. It was assumed that individuals could disperse twice as far as longest documented distance (assuming that observed dispersal underestimates maximum dispersal due to sampling error).

3. A minimum linkage width of 2 km (1.2 miles) was assumed – a very conservative assumption that accommodates virtually all potential edge effects and climate change.

4. Field investigations were conducted to ground-truth for existing habitat conditions, existing barriers, potential passageways, and identify restoration opportunities.

Figures 18 through 21 overlay the results of the SCMLP on Newhall lands. *Figure 18* shows that the easternmost branch of the LCU area for mule deer, mountain lion, and badger is located along the Ventura/Los Angeles County boundary and overlaps with the Newhall Ranch High Country SMA and Salt Creek Area south of SR-126. North of SR-126, the LCU is located almost entirely in Ventura County in proximity to Newhall lands and extends into Piru Creek, Hoiser Canyon, and upper San Martinez Grande Canyon. Based on the LCU, Newhall development will not directly impact the LCU area. South of the Santa Clara River, the closest planned development in relation to the LCU area is about 3,500 feet to the east. This distance will provide the LCU adequate buffer from indirect development effects. North of the Santa Clara River, the distance between the development edge and eastern boundary of the LCU is about 800 feet. However, the width of the LCU in this area is about 10,000 feet (1.9 miles), so indirect impacts in the portion of the LCU would be minor and not significantly affect the function of the corridor in this area. The LCU is wide enough to absorb some indirect effects north of the Santa Clara River without compromising the function of the corridor.

Figure 19 shows that the LCC for the mountain lion is confined to the eastern branch of the LCU and the highest permeability (lowest cost) area is in Ventura County west of the Newhall Ranch Specific Plan. The portion of the LCC on the Specific Plan site is rated as less permeable.

Figure 20 illustrates that the LCC for the mule deer comprises the western and eastern branches of the LCU. The western branch has the highest permeability and the eastern branch, which includes the High Country SMA and Salt Creek Area, has lower permeability.

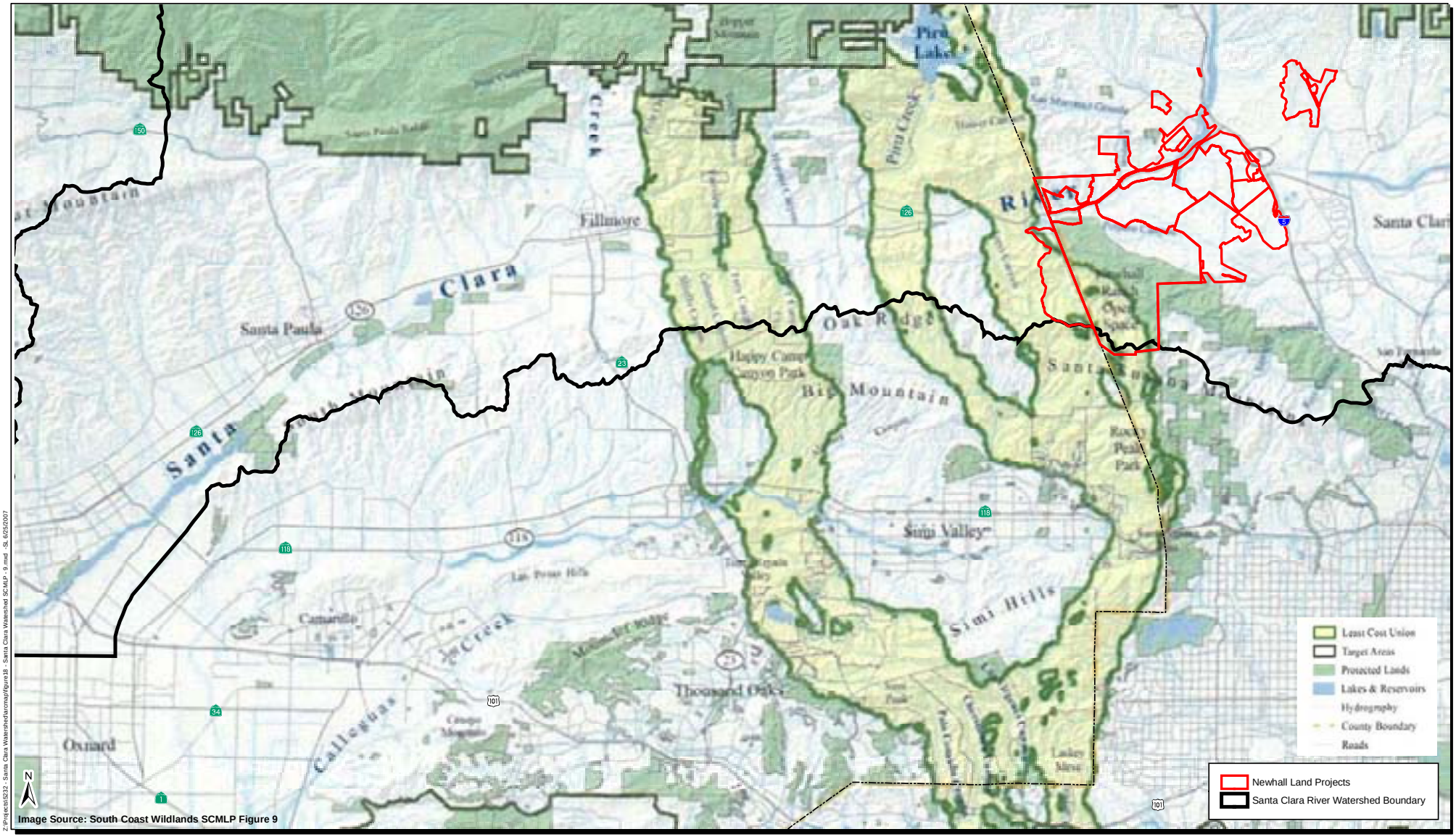


Image Source: South Coast Wildlands SCMLP Figure 9

Z:\Projects\5232 - Santa Clara Watershed\arcmap\figure18 - Santa Clara Watershed SCMLP - 9.mxd - SL 6/25/2007

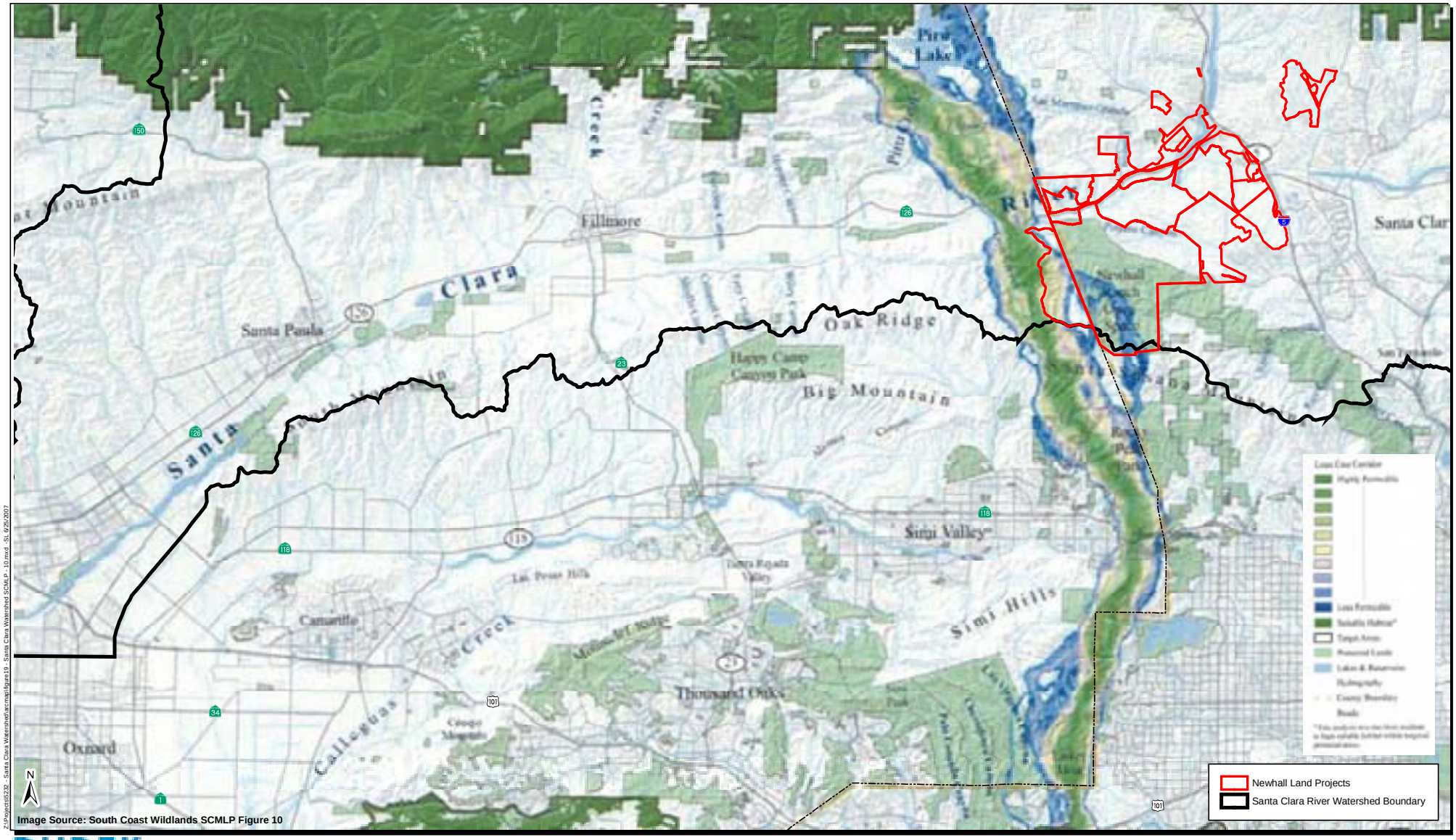
DUDEK
Santa Barbara GIS Division
621 Chapala St
Santa Barbara, Ca 93101
(805)963-0651

0 5 10 Miles

Newhall Land - Santa Clara River Watershed

Least Cost Union for Mountain Lion, Mule Deer, and American Badger

FIGURE 18



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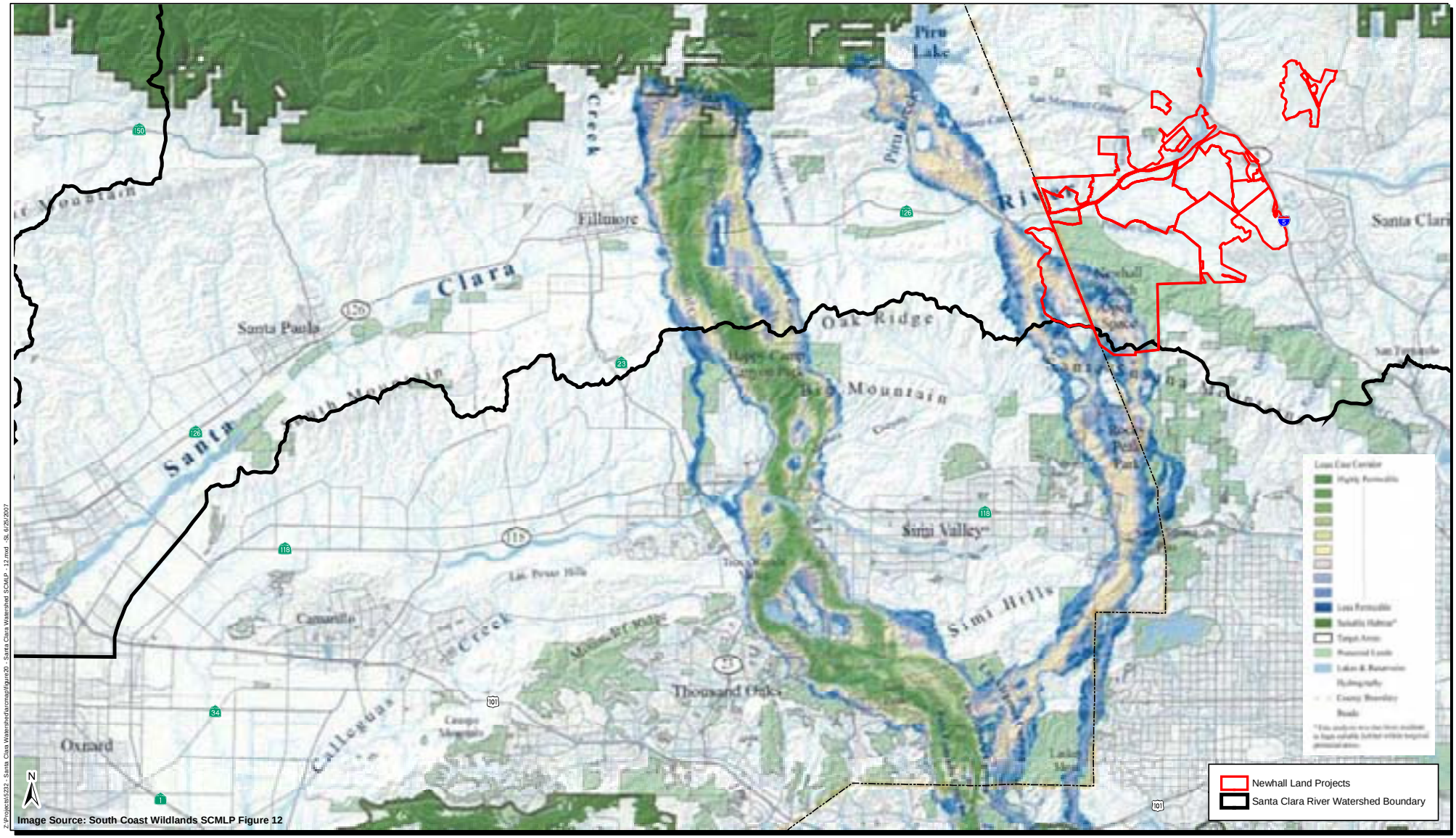
0 5 10 Miles

Newhall Land - Santa Clara River Watershed
Least Cost Corridor for Mountain Lion

FIGURE 19



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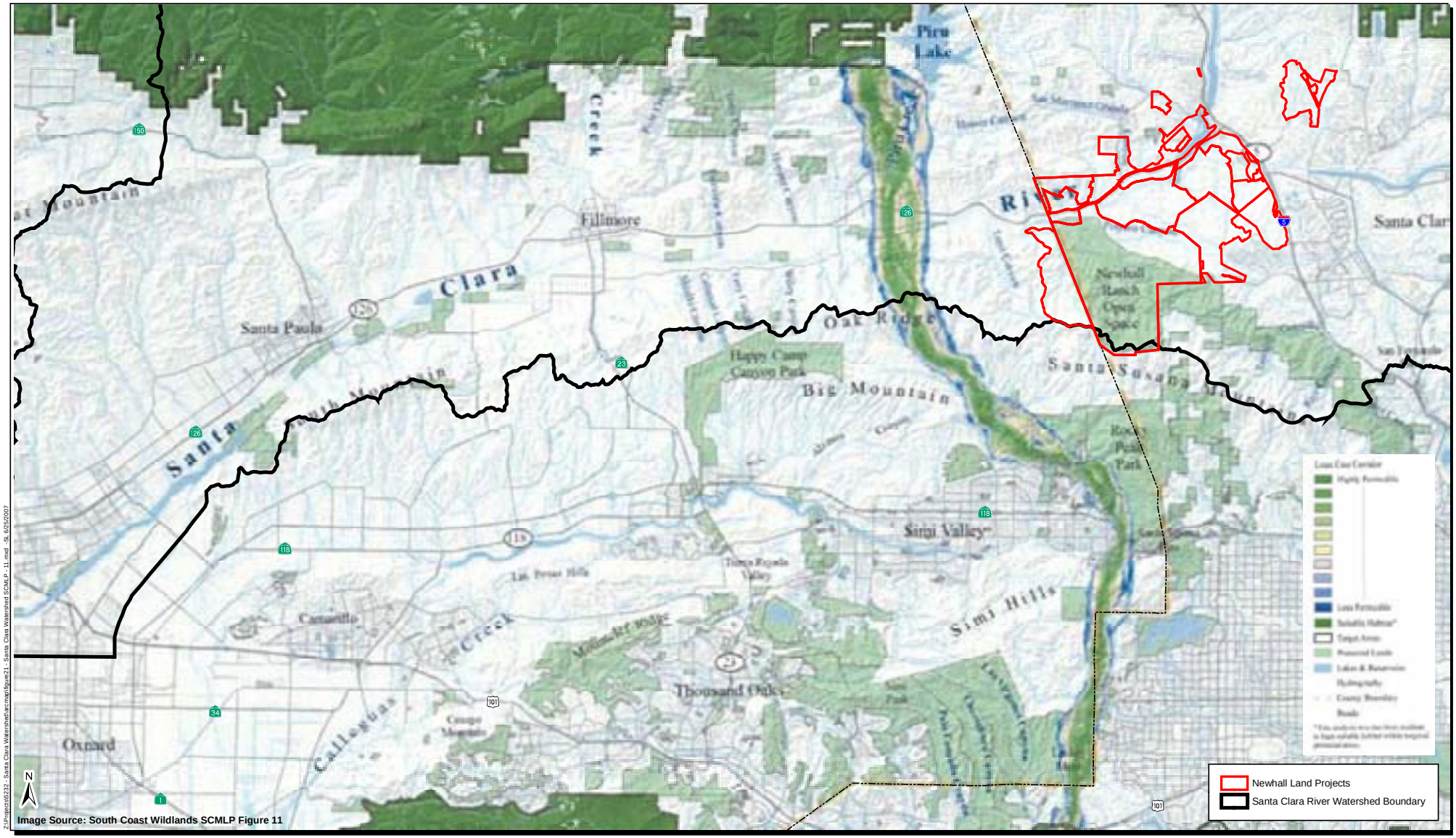
Newhall Land - Santa Clara River Watershed
Least Cost Corridor for Mule Deer

FIGURE 20



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0 5 10 Miles

Newhall Land - Santa Clara River Watershed

Least Cost Corridor for American Badger

FIGURE 21

Figure 21 shows that the American badger's main linkage branch generally is located to the west and does not overlap with Newhall lands.

4.0 DISCUSSION

This section discusses the proposed development on Newhall lands in the context of data presented in *Section 3.0* for existing baselines conditions in the SCRW, current land use classifications, approved and planned projects in the City of Santa Clarita and Los Angeles County, and CDFG and ACOE permits that were issued between 1988 and 2006. Several general observations can be drawn from the baseline data and other data analyzed in *Section 3.0*:

- The SCRW is for the most part undeveloped.
- The SCRW has substantial existing public lands and open spaces that will be protected in perpetuity.
- Under current land use classifications, the large majority of the SCRW would remain undeveloped, but land use classifications in Los Angeles County could allow for more development than provided for by approved and planned projects. Although land use classifications do not equate to the amount of impervious surface created, current land classifications represent a "worst-case" development scenario.
- Under current land use classifications, important biological and physical features of the overall watershed would be retained. The major vegetation communities (coastal scrubs, chaparral, non-native grassland, woodlands and forest, and riparian/wetlands) are still relatively common in the watershed and would remain relatively common due to the substantial set-aside of existing public lands and open space in and adjacent to the SCRW.
- There has been a cumulative net increase in jurisdictional waters/wetlands resulting from mitigation under CDFG and ACOE permits issued between 1988 and 2006.
- Planned and approved projects in Santa Clarita and Los Angeles County would increase the amount of development in the watershed by about 4%.
- Newhall lands are a very small proportion of the overall watershed and are limited to a small area in the southern portion of the watershed.
- Planned development on Newhall lands would contribute a very small percentage of future development in the watershed and would be substantially less than the amount of development allowed under the current land use classifications

- Planned development on Newhall lands is downstream and adjacent to existing, planned, and approved urban land uses in the city of Santa Clarita and Valencia community.
- Regional wildlife corridors and habitat linkages will be preserved in the SCRW.

These issues are discussed further below.

The Santa Clara River Watershed is Relatively Undeveloped and Has Substantial Existing and Designated Open Space.

Based on California GAP Project dataset, as of 1999 approximately 51,700 acres of the SCRW has been converted to agricultural uses and 47,300 acres to industrial, commercial and urban uses, together comprising about 10% of the total watershed (*Table 2*).

Based on current public lands and currently classified open space, approximately 733,526 acres (71%) of the SCRW are existing or classified open space (*Table 1* and *Figure 3*), including 635,172 acres of existing public lands (see *Table 8*). Relatively large sub-basins with very substantial existing and/or classified open space include Eastern, Hungry Valley, Topa Topa, and Upper Piru (*Figure 3*). With the exception of Eastern, the vast majority of these sub-basins are open space – 93% of Hungry Valley, 97% of Topa Topa, and 98% of Upper Piru. Although only 55% of Eastern is open space, because of its large size, 160,099 acres are in open space, second only to Upper Piru which has 165,152 acres in open space. Smaller sub-basins with high percentages of open space include Bouquet, Mint Canyon, Sisar, and Stauffer.

Figure 4 shows that the vast majority of land conversion has occurred in the southern portion of the watershed along the Santa Clara River (mostly agriculture), with urban development in the cities of Ventura, Santa Paula, Santa Clarita, and the communities of Valencia and Acton. An additional 39,000 acres are planned or approved in the City of Santa Clarita and County of Los Angeles, of which about 1,420 acres are mapped urban or built-up land (*Table 2*), which would increase the converted land in the watershed to approximately 136,600 net acres, or about 13% of the SCRW, or otherwise increasing the amount of converted lands in the watershed by about 3%. In Ventura County, the SOAR initiatives are expected to limit the amount of urban development of existing agriculture in areas classified for development.

Biological and Physical Features of the Santa Clara River Watershed Related to Watershed Function Would be Retained Under Current Land Use Classifications.

Tables 2 through *6* and *Subsection 3.1* summarize the relationship between current land use classifications and vegetation communities and land types, geologic types, soils types, elevations, and slopes, respectively. A general assumption is that ecological functions and values are complexly related to these biological and physical features (e.g., geology, hydrology,

chemistry, etc.) and that preserving a substantial representation of the diversity of each is important for a healthy watershed even if there is a relatively poor understanding of the dynamics of these complex relationships. For example, it is important to have representation of resources at all elevation ranges in the watershed. Analyzing impacts under the current land use classifications provides a "worst-case" assessment, and, in terms of overall impacts, development acreages likely will be substantially reduced at the project-level. Also, current land use classification acreages are not equivalent to the amount of impervious surface that would result from development.

Although some vegetation communities proportionally would be more heavily impacted than others, the majority of most of the vegetation types in the watershed would be preserved (*Table 2*). An important exception is southern alluvial fan scrub, for which more than 90% of the mapped community is in classified development. However, under the CDFG (2003) vegetation mapping system, this community, which likely translates to Riversidean alluvial fan sage scrub in the CDFG mapping system, is a special-status vegetation community and will require minimization and mitigation for impacts. It is highly unlikely that 90% of this community would be permanently lost. Venturan coastal sage scrub is another community that would be substantially impacted out of proportion with other vegetation communities in the watershed; 49% of this community would be impacted under current classifications. Part of the difficulty with this community is that it tends to occur on the lower elevation and more gentle slopes where more development is planned. However, coastal sage scrub provides habitat for a number of special-status wildlife and plant species, and minimization, and mitigation likely will be required. About 42% of non-native grassland, which also tends to occur on level, developable lands, would be impacted under current classifications. Chaparrals, which tend to occur in more rugged, higher elevation terrain, overall would have relatively few impacts at only 15% of the general community (*Table 2*). Impacts to the different types of chaparral range from no impacts to mesic north-slope chaparral to 22% of interior live oak chaparral. Riparian and wetland impacts would occur to about 27% of the mapped area, but as resources regulated by CDFG and ACOE, and under the "no net loss" policy, this level of impact is anticipated to be mitigated (also see discussion below regarding cumulative impacts to jurisdictional waters and wetland resources). Similar to chaparrals, woodlands and forests would have relatively few impacts, at 16% overall and ranging from no impacts to several types to 38% impacts to California walnut woodland. However, walnut woodland is also a special-status vegetation community under the CDFG (2003) mapping system and will require avoidance, minimization, and mitigation.

With regard to physical features – geologic types, soils, elevations, and slopes – development under current classifications would disproportionately impact resources that tend to occur in more developable areas in the watershed – that is, relatively level terrains at lower elevations. As such, four geologic types, alluvium associated with the lower river valley, Miocene nonmarine,

Pliocene marine, and tertiary volcanic flow rocks would be impacted at levels ranging from 70%–78% of their distribution in the watershed under current classifications.

Similarly, several soils would be disproportionately impacted under current classifications: Pico-Anacapa-Salinas, which is associated with the lower river valley; Badland-Calleguas-Lithic Xerothents, which is associated with areas classified for very low-density residential: Soboba-Avawatz-Oak Glen, which is the dominant soil type in the southeastern portion of the watershed and is associated with areas classified for low- and very low-density residential; Oak Glen-Xerofluents-Dotta, which is located in the northwestern portion of the watershed in an area classified for medium-density residential; and Soper-Chesterton-Rincon.

Classified development at different elevations follows a very simple pattern – the heaviest development is classified for areas at the lowest elevations and the least at higher elevations. The breakpoint occurs at around 2,000 feet, where 50% of lands between 1,500 and 2,000 feet would be developed and 29% of lands between 2,000 and 2,500 feet would be developed. About 59% of all lands under 2,000 feet would be developed while only 17% of lands over 2,000 feet would be developed. Strictly from a hydrologic and geomorphic perspective, siting development at lower elevations in the watershed and protecting headwaters is preferred because natural drainage and sediment transport patterns are more likely to be retained when the headwaters and upper portions of the watershed are protected. Issues in the lower portions of the watershed are more related to maintaining riparian ecosystem integrity, including riparian corridors and their buffers, floodplain connections, and habitats of riparian/wetland species.

Development of slopes follows a similar pattern as elevation and again is related to location and developability. The gentlest slopes occur in association with the river valley and this is where most past and planned development occurs. The large majority of development occurs on slopes less than 20%, accounting for 86% of the potential development (*Table 7*). About 46% of lands with slopes less than 20% would be developed, while only 13% of lands with slopes greater than 20% would be developed.

Cumulative Net Increase in Jurisdictional Waters/Wetlands.

As discussed in detail in *Subsection 3.2* and shown in *Figures 10* and *11*, there has been a cumulative net increase in jurisdictional water/wetlands as a result of mitigation for activities permitted by the CDFG and ACOE between 1988 and 2006 in Los Angeles and Ventura counties; on the order of 275 acres for ACOE and 316 acres for CDFG. Although these acreages assume 100% success of the mitigation and it is likely that some of the mitigated acreage has not been successful for various reasons (e.g., poor design, inappropriate soils or hydrology, poor maintenance, etc.), it can reasonably be assumed that there has not been a net cumulative loss of the waters and wetlands from agency-permitted activities in the watershed since 1988. As new

projects are approved and constructed, with a better understanding and improvement of technologies of waters and wetlands protection and restoration, it is further likely that wetland and riparian functions and values in the watershed will be enhanced in the future. For example, Section 7.1.2 of the Newhall Ranch RMDP describes mitigation requirements that will include creation, restoration and enhancement of vegetation communities in the Santa Clara River Corridor SMA/SEA 23. These mitigation requirements include reclamation and restoration of habitats removed in the past for agricultural, oil and natural gas operations, enhancement of existing native habitats that have been moderately disturbed by such past activities, and monitoring and management of these resources.

Planned and Approved Projects.

The analysis of planned and approved projects presented in *Subsection 3.3* was limited to the City of Santa Clarita and Los Angeles County because this information was not available for Ventura County. The analysis of planned and approved projects showed that to date about 39,030 acres (13%) of 303,045 acres of classified development have a planned or approved project (*Table 7*). With regard to different land use classifications, the highest percentages (23%–32%) of planned and approved projects are for areas classified as commercial and industrial, while classified residential areas have lower percentages of planned and approved projects (4%–11%). Planned development has the highest overall percentage of planned and approved projects at about 45%. Overall, planned and approved projects comprise a relatively small percentage (9%) of the Los Angeles County portion of the watershed (4% of the entire watershed) and tend to be located at the lower elevations (1,000–2,000 feet) and on the more gentle slopes in the watershed. Only 101 acres above 4,000 feet would be developed and no development would occur above 4,500 feet. The vast majority (93%) of planned and approved projects occur on slopes less than 20% and 99% are on slopes less than 30%.

Newhall Lands Comprise a Very Small Proportion of the Santa Clara River Watershed.

Newhall lands comprise a very small proportion (<2%) of the SCRW (*Table 17*). Planned development on Newhall lands would impact only 1% of the total watershed. Further, Newhall developments are confined to an already substantially urbanized area of one sub-basin – the Eastern sub-basin – which has the most existing land conversion in the watershed (*Table 3* and *Figure 4*). Newhall developments are downstream of, and contiguous with, urban development in the city of Santa Clarita and the Valencia community. If additional development is to occur in the SCRW, the location of Newhall lands is where development should be planned to avoid and minimize future impacts on watershed function. The Newhall projects would not impact the headwaters of the Eastern and Santa Felicia sub-basins.

Proposed Development on Newhall Lands is Substantially Less than Would Occur under Current Land Use Classifications.

Current land use classifications would allow up to 15,029 acres (85%) of development on Newhall lands (*Table 17*). Planned development would affect 11,087 acres (59%), a reduction of 3,942 acres, or 26% less development than would be allowed under current classifications. This reduction is mostly accounted for by the preservation of lands in the High County SMA/SEA 20 that are classified for very low-density residential (see *Figure 12*). About 6,159 acres are classified for very low residential development, but only 1,875 acres are actually planned for development in these areas, a net reduction of 4,284 acres in this classification.

Potential Impacts of Development on Newhall Lands Primarily Relate to Mainstem Downstream Effects in the Santa Clara River and Not the Overall Watershed.

Planned development on Newhall lands would not affect the large majority of the watershed. Sub-basins completely unaffected by Newhall development include Acton, Bouquet, Mint Canyon, Sierra Pelona, Hungry Valley, Upper Piru, Stauffer, Topa Topa, and Sisar. These sub-basins combined total 531,783 acres (51%) in the watershed, of which 460,600 acres (87%) are in existing and classified opened space. Open space percentages in these sub-basins range from 32% for the Sierra Pelona sub-basin (3,053 acres of 9,677 acres total) to 97% for the Topa Topa sub-basin (156,212 acres of 160,416 acres total). Adding the remaining sub-basins that may be directly or indirectly affected by Newhall development, a total of 733,526 acres are in existing or planned open space, or 71% of the total (*Table 1*). However, this is conservative because it is based on current land use classifications. For example, in the Eastern sub-basin, classifications would allow for 131,631 acres of development (54%). As shown in *Table 9*, however, the total acreage for planned and approved projects in the Eastern sub-basin is 37,747 acres, which comprises 13% of the sub-basin. Ultimately, build-out in the Eastern sub-basin, including Newhall projects, will be substantially less than would occur under current land use classifications and the overall percentage of the watershed in open space will be higher than 71%.

Newhall lands occur at lower elevations along the southern edge of the watershed area adjacent to the Santa Clara River (*Figure 16*) and development is planned for areas contiguous with existing urban development at these lower elevations (*Figure 13*). Potential watershed impacts thus primarily concern various downstream biological and abiotic effects to the river and sub-basins. Sub-basins downstream of Newhall lands include Santa Felicia, Fillmore and Sulfur Springs, and the undefined sub-basin (which includes the City of Ventura), all of which drain directly into the Santa Clara River (see *Figure 2*). These downstream sub-basins total about 213,058 acres and comprise about 21% of the total area of the SCRW. However, because these sub-basins include the Santa Clara River Valley and occur on gentler slopes in the watershed,

they also support the most converted lands (agriculture and urban development) in the watershed. According to the California GAP Analysis Project data (1999), approximately 53,034 acres (25%) of these sub-basins have been converted to agricultural (34,917 acres; 19%) and urban uses (13,617 acres; 6%).

The main concern for development of Newhall projects regarding watershed function is maintaining riparian ecosystem integrity along the Santa Clara River, as discussed above, and habitat for the numerous special-status aquatic and riparian species that occur in the mainstem Santa Clara River. In the case of Newhall projects, the geographic area addressed in evaluating impacts is the watershed areas tributary to the reaches of the Santa Clara River. The cumulative impact analyses herein take into account potential impacts both to drainages tributary to the River and to the River itself. It also is based upon a review of the incremental contribution of the Newhall projects to hydrologic impacts to the Santa Clara River, when taken together with the impacts of other projects. Such impacts are not considered significant.

Regional Wildlife Corridors and Habitat Linkages Will Be Preserved.

Subsection 3.4.9 discusses the relationship between Newhall lands and regional wildlife corridors and habitat linkages. The two main corridors and linkages – the east west Santa Clara River Corridor and the north-south Santa Monica-Sierra Madre connection – would both be preserved in the context of their relationship to Newhall lands. The Santa Clara River Corridor will be preserved, including upland transition zones between the river and development, and managed to preserve its function as a regionally-significant wildlife corridor and habitat linkage. The north-south linkages that were identified by the SCMLP for mountain lion, mule deer, and American badger are generally west of Newhall Land and will not be affected by Newhall development

5.0 REFERENCE SECTION

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APPENDIX A

Detailed Watershed Breakdown Tables

APPENDIX A

TABLE A-1
Santa Clara River Watershed, Sub-basins and Current Land Use Zoning

Sub-basin	Acres in Sub-basin	Percent of Sub-basin	Current Land Use Zoning[a]												
			Commercial			Residential				Other Development			Open Space/Reserve		
			Low Density	High Density	Industrial	Very Low Density	Low Density	Medium Density	High Density	Planned Develop-ment	Mixed Use	Total Develop-ment	Zoned Open Space	Urban Reserve	Total Open Space/ Reserve
Acton	88,787	8.6%	3	0	0	23,450	12,030	548	0	1,220	0	37,251	51,536	0	51,536
Bouquet	8,699	0.8%	0	0	0	1,290	0	0	0	0	0	1,290	7,409	0	7,409
Eastern	291,730	28.1%	2,868	3,580	7,366	68,286	16,712	24,531	903	7,385	0	131,631	160,099	0	160,099
Fillmore	49,154	4.7%	171	0	550	15,776	8,635	1,301	207	0	0	26,641	22,470	43	22,513
Hungry Valley	39,300	3.8%	0	0	0	0	420	0	0	2,205	0	2,625	36,675	0	36,675
Mint Canyon	10,836	1.0%	0	0	0	1,805	1,539	0	0	193	0	3,537	7,299	0	7,299
Santa Felicia	78,066	7.5%	26	0	44	23,829	5,917	169	8	1	0	29,995	48,072	0	48,072
Sierra Pelona	9,677	0.9%	92	0	0	2,205	3,273	0	0	1,053	0	6,624	3,053	0	3,053
Sisar	7,433	0.7%	0	0	0	0	1,183	129	0	0	0	1,313	6,120	0	6,120
Stauffer	37,470	3.6%	0	0	0	0	10,327	0	0	0	0	10,327	27,143	0	27,143
Sulfer Springs	66,033	6.4%	418	0	576	15,729	13,477	829	546	0	61	31,635	33,861	537	34,398
Topa Topa	160,416	15.5%	0	0	0	0	4,204	0	0	0	0	4,204	156,212	0	156,212
undefined	19,805	1.9%	758	331	381	4,583	2,628	2,423	513	0	344	11,960	4,329	3,516	7,845
Upper Piru	169,166	16.3%	0	0	0	534	3,480	0	0	0	0	4,014	165,152	0	165,152
Grand Total	**1,036,571**	**100.0%**	**4,335**	**3,911**	**8,917**	**157,488**	**83,826**	**29,930**	**2,177**	**12,057**	**405**	**303,045**	**729,430**	**4,096**	**733,526**

TABLE A-2
Vegetation Communities and Land Cover Types in the Santa Clara River Watershed

Vegetation Type	Total Acres	Percent Total	Current Land Use Zoning[a]												
			Commercial			Residential				Other Development		Total Develop-ment	Open Space/Reserve		
			Low Density	High Density	Industrial	Very Low Density	Low Density	Medium Density	High Density	Planned Develop-ment	Mixed Use		Zoned Open Space	Urban Reserve	Total Open Space/ Reserve
Agricultural Land	28,791	2.8%	106	0	151	6,136	15,533	495	354	0	169	22,944	4,965	882	5,847
Bare Exposed Rock	702	0.1%	0	0	0	0	0	0	0	0	0	0	702	0	702
Big Sagebrush Scrub	4,996	0.5%	0	0	0	90	2,029	0	0	0	0	2,120	2,877	0	2,877
Bigcone Spruce-Canyon Oak Forest	15,974	1.5%	0	0	0	0	310	0	0	0	0	310	15,664	0	15,664
Black Oak Forest	925	0.1%	0	0	0	0	0	0	0	0	0	0	925	0	925
Buck Brush Chaparral	88,367	8.5%	0	0	0	6,081	1,558	87	0	3	0	7,729	80,638	0	80,638
California Walnut Woodland	3,624	0.3%	0	0	0	471	878	24	0	0	0	1,373	2,251	0	2,251
Canyon Live Oak Forest	1,951	0.2%	0	0	0	0	0	0	0	0	0	0	1,951	0	1,951
Ceanothus crassifolius Chaparral	76,116	7.3%	203	747	62	8,270	664	2,383	99	1,234	0	13,663	62,453	0	62,453
Chamise Chaparral	131,091	12.6%	43	158	4,136	14,823	4,528	2,116	27	707	0	26,536	104,555	0	104,555
Coastal Sage-Chaparral Scrub	2,452	0.2%	0	0	0	158	0	32	0	17	0	207	2,245	0	2,245
Evergreen Orchard	6,236	0.6%	0	0	0	5,046	676	0	0	0	0	5,722	515	0	515
Interior Live Oak Chaparral	73,273	7.1%	12	0	0	14,540	535	1,014	0	59	0	16,161	57,113	0	57,113
Interior Live Oak Forest	1,783	0.2%	0	0	0	0	0	0	0	0	0	0	1,783	0	1,783
Jeffrey Pine Forest	10,169	1.0%	0	0	0	0	0	0	0	0	0	0	10,169	0	10,169
Jeffrey Pine-Fir Forest	5,258	0.5%	0	0	0	0	22	0	0	0	0	22	5,236	0	5,236
Mesic North Slope Chaparral	1,778	0.2%	0	0	0	0	0	0	0	0	0	0	1,778	0	1,778
Mixed Montane Chaparral	2,676	0.3%	0	0	0	0	20	0	0	0	0	20	2,656	0	2,656
Mojavean Pinyon and Juniper Woodlands	98,151	9.5%	0	0	0	8,878	10,831	234	0	1,904	0	21,848	76,303	0	76,303
Montane Ceanothus Chaparral	3,582	0.3%	0	0	0	203	96	0	0	0	0	299	3,283	0	3,283
Mule Fat Scrub	2,587	0.2%	1	0	141	658	343	2	0	0	0	1,145	1,404	39	1,443
Non-Native Grassland	22,240	2.1%	0	0	0	5,813	2,872	387	0	382	0	9,454	12,786	0	12,786
Northern Mixed Chaparral	70,033	6.8%	0	0	0	11,757	2,372	8	0	31	0	14,167	55,865	0	55,865
Orchard or Vineyard	16,676	1.6%	27	0	204	7,706	7,099	486	16	0	0	15,537	1,128	11	1,139

TABLE A-2
Vegetation Communities and Land Cover Types in the Santa Clara River Watershed

Vegetation Type	Total Acres	Percent Total	Current Land Use Zoning[a]												
			Commercial			Residential				Other Development		Total Develop-ment	Open Space/Reserve		
			Low Density	High Density	Industrial	Very Low Density	Low Density	Medium Density	High Density	Planned Develop-ment	Mixed Use		Zoned Open Space	Urban Reserve	Total Open Space/ Reserve
Permanently-flooded Lacustrine Habitat	5,014	0.5%	0	0	0	359	37	0	0	0	0	396	4,618	0	4,618
Riversidian Sage Scrub	29,418	2.8%	91	0	0	7,172	4,634	144	0	1,493	0	13,534	15,884	0	15,884
Sandy Area Other than Beaches	8,191	0.8%	248	176	99	848	1,759	863	40	383	6	4,421	3,745	25	3,769
Scrub Oak Chaparral	67,134	6.5%	3	0	0	2,219	401	18	0	410	0	3,050	64,083	0	64,083
Semi-Desert Chaparral	6,695	0.6%	0	0	0	1	142	33	0	0	0	176	6,519	0	6,519
Sierran Mixed Coniferous Forest	5,251	0.5%	0	0	0	0	0	0	0	0	0	0	5,251	0	5,251
Southern Alluvial Fan Scrub	5,062	0.5%	0	0	14	2,038	2,513	0	0	0	0	4,564	498	0	498
Southern Coast Live Oak Riparian Forest	1,392	0.1%	0	0	0	0	0	0	0	0	0	0	1,392	0	1,392
Southern Cottonwood-Willow Riparian Forest	4,641	0.4%	81	45	112	608	429	1	0	827	0	2,103	2,539	0	2,539
Southern Sycamore-Alder Riparian Woodland	111	0.0%	0	0	0	0	0	0	0	0	0	0	111	0	111
Southern Willow Scrub	539	0.1%	0	0	0	78	81	0	0	0	0	159	380	0	380
Strip Mines, Quarries and Gravel Pits	1,056	0.1%	0	0	0	0	0	0	0	169	0	169	887	0	887
Upper Sonoran Manzanita Chaparral	30,291	2.9%	0	0	0	3,235	57	0	0	0	0	3,291	26,999	0	26,999
Urban or Built-up Land	47,286	4.6%	2,431	1,744	1,315	7,343	7,634	15,441	1,497	410	229	38,045	6,146	3,095	9,241
Venturan Coastal Sage Scrub	144,932	14.0%	1,088	1,041	2,684	42,957	15,365	6,163	143	4,028	0	73,469	71,420	44	71,463
Westside Ponderosa Pine Forest	10,124	1.0%	0	0	0	0	409	0	0	0	0	409	9,715	0	9,715
Grand Total	**1,036,567**		**4,335**	**3,911**	**8,917**	**157,487**	**83,826**	**29,930**	**2,177**	**12,057**	**405**	**303,044**	**729,427**	**4,096**	**733,523**

TABLE A-3
Geologic Types in the Santa Clara River Watershed in Relation to Current Land Use Zoning

Geologic Type	Total Acres	Percent Total	Current Land Use Zoning[a]												
			Commercial			Residential				Other Development		Total Develop-ment	Open Space/Reserve		
			Low Density	High Density	Industrial	Very Low Density	Low Density	Medium Density	High Density	Planned Develop-ment	Mixed Use		Open Space	Urban Reserve	Total Open Space/ Reserve
Alluvium (Quaternary nonmarine & marine)	84,305	8.1%	3,013	1,807	3,115	18,768	22,683	9,041	1,804	2,900	405	63,535	17,023	3,747	20,771
Eocene marine	155,991	15.0%	0	0	0	116	3,898	0	0	0	0	4,014	151,978	0	151,978
Granitic and metamorphic rocks, pre-Cenozoic	3,666	0.4%	0	0	0	574	2,007	0	0	0	0	2,581	1,085	0	1,085
Mesozoic granitic rocks	98,814	9.5%	0	0	0	13,800	6,750	177	0	1,854	0	22,581	76,233	0	76,233
Miocene marine	123,761	11.9%	7	0	1,355	26,555	6,665	945	2	465	0	35,993	87,768	0	87,768
Miocene nonmarine	32,575	3.1%	479	290	59	11,522	4,124	6,821	96	542	0	23,934	8,641	0	8,641
Oligocene marine	3,508	0.3%	0	0	0	524	0	0	0	0	0	524	2,984	0	2,984
Oligocene nonmarine	57,235	5.5%	0	0	0	4,204	3,036	0	0	71	0	7,311	49,924	0	49,924
Paleocene marine	22,989	2.2%	0	0	0	676	0	0	0	0	0	676	22,313	0	22,313
Paleozoic and Permo- Triassic granitic rocks	16,422	1.6%	0	0	0	2,236	66	0	0	0	0	2,302	14,120	0	14,120
Pliocene marine	73,392	7.1%	62	152	0	30,417	5,721	2,657	106	60	0	39,175	34,199	18	34,217
Plio-Pleistocene nonmarine, Pliocene nonmarine	135,755	13.1%	679	1,662	4,388	11,522	15,131	9,945	169	3,448	0	46,944	88,480	331	88,811
Precambrian granitic rocks	38,984	3.8%	0	0	0	6,724	1,743	121	0	653	0	9,241	29,743	0	29,743
Precambrian rocks, undivided	117,724	11.4%	0	0	0	16,004	4,063	14	0	0	0	20,080	97,644	0	97,644
Schist (metasedimentary or metavolcanic)	38,909	3.8%	95	0	0	8,599	720	90	0	1,768	0	11,272	27,637	0	27,637
Tertiary nonmarine, undivided	12,487	1.2%	0	0	0	513	2,203	0	0	0	0	2,716	9,771	0	9,771
Tertiary volcanic flow rocks	12,286	1.2%	0	0	0	4,702	4,802	120	0	297	0	9,921	2,365	0	2,365
Upper Cretaceous marine	5,705	0.6%	0	0	0	0	43	0	0	0	0	43	5,662	0	5,662
Water	2,057	0.2%	0	0	0	30	170	0	0	0	0	200	1,857	0	1,857
Grand Total	**1,036,567**		**4,335**	**3,911**	**8,917**	**157,487**	**83,826**	**29,930**	**2,177**	**12,057**	**405**	**303,044**	**729,427**	**4,096**	**733,523**

TABLE A-4
Soil Types in the Santa Clara River Watershed in Relation to Current Land Use Zoning

Soil Type	Total Acres	Percent Total	Current Land Use Zoning[a]												
			Commercial			Residential				Other Development			Open Space/Reserve		
			Low Density	High Density	Industrial	Very Low Density	Low Density	Medium Density	High Density	Planned Develop-ment	Mixed Use	Total Develop-ment	Open Space	Urban Reserve	Total Open Space/ Reserve
Aramburu Variant-Modjeska Family-Coarsegold	51,392	0	0	0	0	0	4,631	0	0	0	0	4,631	46,761	0	46,761
Arbuckle-San Ysidro-Positas	883	0	0	0	0	0	257	97	0	0	0	354	529	0	529
Badland-Calleguas-Lithic Xerorthents	18,993	0	0	0	0	12,243	375	916	0	212	0	13,747	5,246	0	5,246
Beam-Kilmer-Badland	2,354	0	0	0	0	0	0	0	0	0	0	0	2,354	0	2,354
Camarillo-Hueneme-Pacheco	74	0	0	0	0	74	0	0	0	0	0	74	1	0	1
Cieneba-Andregg-Vista	5,582	0	0	0	0	0	0	0	0	0	0	0	5,582	0	5,582
Cieneba-Caperton-Gaviota	81,270	0	0	0	0	18,103	1,324	0	0	0	0	19,428	61,842	0	61,842
Cieneba-Exchequer-Sobrante	132,462	0	777	1,363	5,497	21,014	9,056	10,395	193	3,722	0	52,017	80,444	0	80,444
Cieneba-Pismo-Caperton	129,534	0	60	36	59	34,127	18,956	5,213	0	780	0	59,231	70,303	0	70,303
Glean-Mahogan-Metz	1,948	0	0	0	0	0	16	0	0	0	0	16	1,932	0	1,932
Gorman-Oak Glen-Gaviota	36,698	0	0	0	0	0	1,345	0	0	130	0	1,475	35,223	0	35,223
Hambright-Lithic Xerorthents-Rock Outcrop	3,510	0	0	0	0	870	82	0	0	0	0	952	2,558	0	2,558
Hilt-Arrastre-Marpa	42,864	0	0	0	0	0	3,294	0	0	0	0	3,294	39,571	0	39,571
Lodo-Sobrante-Gaviota	36,345	0	95	0	0	7,448	746	90	0	1,768	0	10,146	26,199	0	26,199
Los Gatos-Gamboa-Hilt	90,317	0	0	0	0	0	2,328	0	0	0	0	2,328	87,989	0	87,989
Millerton-Lodo-Millsholm	153,429	0	0	0	0	5,451	2,107	0	0	0	0	7,558	145,871	0	145,871
Oak Glen-Xerofluvents-Dotta	6,564	0	0	0	0	0	4,976	0	0	0	0	4,976	1,588	0	1,588

TABLE A-4
Soil Types in the Santa Clara River Watershed in Relation to Current Land Use Zoning

Soil Type	Total Acres	Percent Total	Current Land Use Zoning[a]												
			Commercial			Residential				Other Development			Open Space/Reserve		
			Low Density	High Density	Industrial	Very Low Density	Low Density	Medium Density	High Density	Planned Develop-ment	Mixed Use	Total Develop-ment	Open Space	Urban Reserve	Total Open Space/ Reserve
Oceano-Baywood-Dune Land	374	0	0	0	0	117	0	0	0	0	0	117	256	0	256
Pico-Anacapa-Salinas	84,613	0	3,397	2,512	3,309	18,583	20,960	12,182	1,984	3,362	405	66,694	14,443	3,475	17,919
Rock Outcrop-Chilao-Stonyford	17,800	0	0	0	0	617	0	0	0	0	0	617	17,183	0	17,183
San Andreas-Arnold-Arujo	5,518	0	0	0	0	471	365	13	0	0	0	850	4,669	0	4,669
San Benito-Castaic-Calleguas	99,503	0	5	0	45	29,985	9,114	1,009	0	1	0	40,158	58,905	441	59,346
Sespe-Lodo-Malibu	8,086	0	0	0	0	1,537	589	0	0	0	0	2,126	5,960	0	5,960
Soboba-Avawatz-Oak Glen	9,296	0	0	0	0	3,903	1,971	0	0	7	0	5,881	3,415	0	3,415
Soper-Chesterton-Rincon	4,443	0	0	0	0	1,997	1,166	16	0	0	0	3,179	1,084	180	1,264
Tollhouse-Rock Outcrop-Bakeoven	1,074	0	0	0	0	0	0	0	0	0	0	0	1,074	0	1,074
Walong-Edmundston-Rock Outcrop	2,853	0	0	0	0	0	0	0	0	2,075	0	2,075	778	0	778
(No Data)	8,757	0	0	0	7	947	169	0	0	0	0	1,122	7,635	0	7,635
Grand Total	**1,036,534**		**4,335**	**3,911**	**8,917**	**157,487**	**83,826**	**29,930**	**2,177**	**12,057**	**405**	**303,044**	**729,394**	**4,096**	**733,490**

TABLE A-5
Elevations in the Santa Clara River Watershed in Relation to Current Land Use Zoning

Elevation (feet)	Total Acres	Percent Total	Current Land Use													
			Commercial			Residential				Other Development		Total Develop-ment	Open Space/Reserve		
			Low Density	High Density	Industrial	Very Low Density	Low Density	Medium Density	High Density	Planned Develop-ment	Mixed Use		Zoned Open Space	Urban Reserve	Total Open Space/ Reserve
0-500	48,058	4.6%	1,336	331	1,440	12,681	14,527	3,312	1,259	0	405	35,292	9,048	3,718	12,766
500-1000	52,187	5.0%	83	0	365	19,037	11,545	1,347	14	856	0	33,249	18,560	378	18,938
1001-1500	95,436	9.2%	2,536	3,284	4,605	17,957	10,850	13,533	773	5,075	0	58,613	36,823	0	36,823
1501-2000	108,424	10.5%	284	296	2,507	30,808	8,003	10,609	130	1,425	0	54,061	54,364	0	54,364
2001-2500	86,661	8.4%	0	0	0	20,754	2,924	537	0	459	0	24,674	61,987	0	61,987
2501-3000	116,903	11.3%	0	0	0	18,454	8,662	45	0	97	0	27,257	89,646	0	89,646
3001-3500	135,348	13.1%	0	0	0	18,190	8,853	175	0	136	0	27,354	107,993	0	107,993
3501-4000	104,922	10.1%	0	0	0	13,103	2,921	219	0	817	0	17,060	87,862	0	87,862
4001-4500	75,120	7.2%	22	0	0	4,458	1,140	96	0	1,571	0	7,286	67,833	0	67,833
4501-5000	66,875	6.5%	63	0	0	1,406	3,420	57	0	1,361	0	6,307	60,568	0	60,568
5001-5500	68,878	6.6%	10	0	0	606	6,862	0	0	259	0	7,737	61,141	0	61,141
5501-6000	38,010	3.7%	0	0	0	0	2,594	0	0	0	0	2,594	35,416	0	35,416
6001-6500	20,474	2.0%	0	0	0	0	1,469	0	0	0	0	1,469	19,005	0	19,005
6501-7000	9,554	0.9%	0	0	0	0	15	0	0	0	0	15	9,539	0	9,539
7001-7500	5,206	0.5%	0	0	0	0	29	0	0	0	0	29	5,177	0	5,177
7501-8000	2,688	0.3%	0	0	0	0	2	0	0	0	0	2	2,685	0	2,685
>8000	1,550	0.1%	0	0	0	0	0	0	0	0	0	0	1,550	0	1,550
Grand Total	**1,036,292**		**4,335**	**3,911**	**8,917**	**157,454**	**83,815**	**29,930**	**2,177**	**12,056**	**405**	**302,999**	**729,197**	**4,096**	**733,293**

TABLE A-6
Slopes in the Santa Clara River Watershed in Relation to Current Land Use Zoning

Slope	Total Acres	Percent Total	Current Land Use Zoning[a]													
			Commercial			Residential				Other Development			Open Space/Reserve		
			Low Density	High Density	Industrial	Very Low Density	Low Density	Medium Density	High Density	Planned Develop-ment	Mixed Use	Total Develop-ment	Open Space	Urban Reserve	Tota Open Space/ Reserve
0%-10%	**361,084**	**34.9%**	4,060	3,694	7,213	66,767	57,452	23,850	2,094	7,122	401	172,652	184,513	3,919	188,432
11%-20%	**362,380**	**35.0%**	224	216	1,634	58,972	20,170	5,236	82	3,007	4	89,546	272,673	162	272,834
21%-30%	**226,184**	**21.8%**	48	0	66	26,610	5,134	761	0	1,728	0	34,347	191,831	7	191,838
31%-40%	**76,504**	**7.4%**	0	0	4	4,776	954	44	0	134	0	5,913	70,591	0	70,591
41%-100%	**9,225**	**0.9%**	0	0	0	225	37	0	0	0	0	262	8,963	0	8,963
Grand Total	**1,035,377**		**4,333**	**3,910**	**8,917**	**157,350**	**83,746**	**29,891**	**2,176**	**11,991**	**405**	**302,719**	**728,570**	**4,087**	**732,658**

TABLE A-7
Planned Development on Newhall Lands in Relation to Current Land Use Zoning

Land Use Zoning	Total Acres	Open Space						Development							
		Conser-vation Easement	High Country Reserve	Salt Creek Reserve	River Corridor	Other Open Space	Total Open Space	RMDP	Entrada	Legacy	VCC	West Creek	Westridge	Others	Total Develop-ment
Low Density Commercial	725	36	0	0	0	10	46	164	430	0	0	0	74	10	678
High Density Commercial	0	0	0	0	0	—	0	0	0	0	0	<1	0	0	0
Industrial	627	0	0	0	44	1	46	<1	167	0	372	0	0	42	581
Very Low Density Residential	6,159	15	3,838	105	75	251	4,283	1,685	0	172	0	0	0	18	1,875
Low Density Residential	4,967	54	0	0	159	442	655	2,046	0	1,621	0	0	632	13	4,312
Medium Density Residential	211	0	0	0	0	0	0	0	29	21	112	4	0	45	211
Open Space	3,635	34	104	1,412	61	246	1,857	1,110	6	0	166	339	0	158	1,779
Planned Development	2,342	0	1	0	637	53	690	670	225	67	0	601	88	0	1,651
Grand Total	**18,665**	**139**	**3,942**	**1,516**	**977**	**1,002**	**7,577**	**5,675**	**857**	**1,881**	**650**	**944**	**794**	**286**	**11,087**

TABLE A-8
Planned Development on Newhall Lands in Relation to Sub-basins

Sub-basin	Total Acres	Open Space						Development							
		Conser-vation Easement	High Country Reserve	Salt Creek Reserve	River Corridor	Other Open Space	Total Open Space	RMDP	Entrada	Legacy	VCC	West Creek	Westridge	Others	Total Develop-ment
Eastern	13,334	139	367	0	977	1,001	2,485	5,440	856	1,880	650	944	794	286	10,850
Santa Felicia	5,329	0	3,575	1,516	0	1	5,093	236	0	0	0	0	0	0	236
Grand Total	**18,663**	**139**	**3,942**	**1,516**	**977**	**1,002**	**7,577**	**5,676**	**856**	**1,880**	**650**	**944**	**794**	**286**	**11,086**

TABLE A-9
Planned Development on Newhall Lands in Relation to Vegetation Communities

		Open Space						Development							
Vegetation Type	**Total Acres**	**Conser-vation Easement**	**High Country Reserve**	**Salt Creek Reserve**	**River Corridor**	**Other Open Space**	**Total Open Space**	**RMDP**	**Entrada**	**Legacy**	**VCC**	**West Creek**	**Westridge**	**Others**	**Total Develop-ment**
Ceanothus crassifolius Chaparral	1213	0	602	0	0	0	602	0	0	0	0	611	0	<1	611
Interior Live Oak Chaparral	2322	0	1,940	0	0	13	1952	293	0	77	0	0	0	0	370
Non-Native Grassland	4200	14	1,071	938	36	253	2312	1,858	0	30	0	0	0	0	1888
Southern Cottonwood-Willow Riparian Forest	737	0	0	7	477	3	487	85	**165**	0	0	0	0	0	250
Venturan Coastal Sage Scrub	10189	125	330	571	465	734	2225	3,439	**690**	1,773	650	332	794	286	7964
Grand Total	**18661**	**139**	**3,942**	**1,516**	**977**	**1,002**	**7,577**	**5,676**	**855**	**1,880**	**650**	**943**	**794**	**286**	**11,084**

TABLE A-10
Planned Development on Newhall Lands in Relation to Geologic Types

Geologic Type	Total Acres	Open Space						Development							
		Conser-vation Easement	High Country Reserve	Salt Creek Reserve	River Corridor	Other Open Space	Total Open Space	RMDP	Entrada	Legacy	VCC	West Creek	Westridge	Others	Total Develop-ment
Alluvium (mostly Quaternary)	4,293	37	37	112	936	137	**1,259**	753	852	38	445	127	791	28	3,034
Miocene marine	766	0	390	263	0	0	**653**	0	0	0	0	0	0	113	113
Pliocene marine	8,931	39	3,515	1,142	0	603	**5,299**	3,214	0	418	0	0	0	0	3,632
Plio-Pleistocene nonmarine, Pliocene nonmarine	4,670	62	0	0	41	263	**367**	1,708	4	1,423	204	816	3	145	4,303
Grand Total	**18,660**	**139**	**3,942**	**1,516**	**977**	**1,002**	**7,577**	**5,676**	**856**	**1,879**	**649**	**943**	**794**	**286**	**11,083**

TABLE A-11
Planned Development on Newhall Lands in Relation to Soils

Soil Type	Total Acres	Open Space						Development							
		Conser-vation Easement	High Country Reserve	Salt Creek Reserve	River Corridor	Other Open Space	Total Open Space	RMDP	Entrada	Legacy	VCC	West Creek	Westridge	Others	Total Develop-ment
BADLAND-CALLEGUAS-LITHIC XERORTHENTS	1,707	0	1,625	0	0	0	1,625	69	0	12	0	0	0	0	81
CIENEBA-EXCHEQUER-SOBRANTE	8,578	97	606	0	161	675	1,540	3,807	49	1,867	155	738	167	254	7,037
PICO-ANACAPA-SALINAS	4,436	42	0	49	793	98	982	1,287	807	0	495	205	628	32	3,454
SAN ANDREAS-ARNOLD-ARUJO	607	0	0	607	0	0	607	0	0	0	0	0	0	0	0
SAN BENITO-CASTAIC-CALLEGUAS	3,335	0	1,710	860	23	229	2,823	512	0	0	0	0	0	0	512
Grand Total	**18,663**	**139**	**3,942**	**1,516**	**977**	**1,002**	**7,577**	**5,676**	**856**	**1,879**	**650**	**943**	**795**	**286**	**11,085**

TABLE A-12
Planned Development on Newhall Lands in Relation to Elevations

Elevation Range	Total Acres	Open Space						Development							
		Conser-vation Easement	High Country Reserve	Salt Creek Reserve	River Corridor	Other Open Space	Total Open Space	RMDP	Entrada	Legacy	VCC	West Creek	Westridge	Others	Total Develop-ment
500-1000	2,630	16	86	144	934	191	1,371	944	65	0	250	0	0	0	1,259
1001-1500	11,244	124	1,072	593	43	749	2,580	4,568	791	948	399	900	778	279	8,663
1501-2000	3,152	0	1,563	365	0	63	1,991	163	0	931	0	44	16	7	1,161
2001-2500	986	0	722	264	0	0	986	0	0	0	0	0	0	0	0
2501-3000	618	0	468	150	0	0	618	0	0	0	0	0	0	0	0
3001-3500	32	0	32	0	0	0	32	0	0	0	0	0	0	0	0
Grand Total	**18,662**	**139**	**3,942**	**1,516**	**977**	**1,002**	**7,577**	**5,676**	**856**	**1,879**	**649**	**944**	**794**	**286**	**11,084**

TABLE A-13
Planned Development on Newhall Lands in Relation to Slopes

		Open Space						Development							
Slope	Total Acres	Conser-vation Easement	High Country Reserve	Salt Creek Reserve	River Corridor	Other Open Space	Total Open Space	RMDP	Entrada	Legacy	VCC	West Creek	Westridge	Others	Total Develop-ment
0%-10%	10,506	99	587	299	819	472	2,277	3,675	831	1,279	556	904	765	220	8,230
11%-20%	5,326	36	1,547	678	138	422	2,820	1,706	24	557	85	39	29	66	2,506
21%-30%	2,457	4	1,518	476	20	102	2,120	288	0	41	8	0	0	0	337
31%-40%	365	0	290	59	0	6	355	7	0	2	1	0	0	0	10
Grand Total	**18,654**	**139**	**3,942**	**1,512**	**977**	**1,002**	**7,572**	**5,676**	**855**	**1,879**	**650**	**943**	**794**	**286**	**11,083**

Report on Interim Late Winter and Spring Survey of Raptors and Special-Status Bird Species
Bloom Biological, Inc., June 2007

REPORT ON INTERIM LATE WINTER AND SPRING SURVEY OF RAPTORS AND SPECIAL-STATUS BIRD SPECIES ON PORTIONS OF NEWHALL LAND AND FARMING COMPANY PROPERTY, LOS ANGELES COUNTY, CALIFORNIA

Prepared for:

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June 26, 2007

INTRODUCTION

Extensive field surveys of all occurring and potentially occurring special-status, or sensitive, avian species and all raptors (both common and special-status) were conducted on portions of Newhall Land and Farming Company property by Bloom Biological, Inc. from February through June, 2007. The surveys were conducted in response to concerns that sensitive bird species were not adequately addressed in the Landmark Village Draft Environmental Impact Report. Focused surveys for least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*) were conducted according U.S. Fish and Wildlife Service (USFWS) survey protocol. Surveys for yellow-billed cuckoo (*Coccyzus americanus occidentalis*) were also conducted concurrent with the vireo and flycatcher surveys. Special emphasis was placed on finding raptor nest locations and sensitive riparian birds. This report summarizes the findings of this survey effort.

The entire survey area consisted of approximately 25 miles of the Santa Clara River and its major tributaries in and around Valencia, Los Angeles County, California. Tributaries that were included in the survey area were lower Castaic Creek, San Francisquito Canyon, and the South Fork of the Santa Clara River. The limits of the survey area include the entire Santa Clara River from ¼ mile downstream of the Las Brisas Crossing in Ventura County upstream to the future location of the Golden Valley Bridge (east of the Los Angeles Aqueduct). The survey area encompassed all habitats within the riverbed and approximately ½ mile on each side of the river. Contained within this general survey area was the Landmark Village project impact area (Figure 1), including an area up to one mile beyond the project site boundary.

METHODOLOGY

Wintering bird surveys, burrowing owl surveys, and raptor nest surveys were conducted between 24 February and 25 March, 2007. Raptor nest surveys continued throughout the spring and continue beyond the writing of this report. Surveys were conducted up to one mile out from the Landmark Village project impact area boundary. Surveys were conducted during daylight hours as well as up to four hours after sunset. Surveys were conducted by walking and/or driving systematically along dirt roads, foot paths, streambeds, and canyon bottoms throughout the survey area. Special emphasis was placed on thoroughly surveying all agricultural and abandoned fields at dusk and dark hours for presence of burrowing owls. Several nights were spent surveying and camping in selected oak woodlands surrounding the Landmark Village project site in an attempt to detect the presence of long-eared owls. GPS waypoint locations were recorded for all active raptor nests as well as suspected nest sites. All active nests were monitored throughout the survey period to determine outcome.

Special-status riparian bird surveys were conducted in conjunction with least Bell's vireo and southwestern willow flycatcher protocol surveys along the 25-mile stretch of the Santa Clara River and major tributaries. Survey area consisted of all riparian habitat within and surrounding the river, which was anywhere between ¼ mile and ¾ mile wide. As of this writing, six of eight presence/absence protocol surveys have been conducted for least Bell's vireo between 18 April and 15 June, 2007. Two of five presence/absence protocol surveys have been conducted for southwestern willow flycatcher along a condensed stretch of the same survey area, meaning only stretches of river that had running water were surveyed for willow flycatchers. All potential and marginally potential habitat was surveyed by slowly walking and stopping to listen for calls and songs. All surveys followed the most recent U.S. Fish and Wildlife Service (USFWS) field survey protocol for each species (USFWS 2001), and were conducted by biologists Chris A. Niemela, Karly Moore, Peter H. Bloom, and Andrew Forde. The study area was divided into nine survey areas based on least Bell's vireo protocol survey distance limits (Figure 2).

These areas are named as follows: Las Brisas; County Line; West of Castaic Creek; East of Castaic Creek; I-5 Fwy Urban; River Village; Castaic Creek; San Francisquito Easement; and South Fork.

Although all birds detected were recorded, special emphasis was placed on finding those considered to be of special status by federal and state resource agencies and conservation organizations. Special-status birds were surveyed within the riparian area and within the adjacent agricultural areas within the Landmark Village impact area. No effort was spent surveying for special-status upland (e.g., coastal sage scrub) bird species during these surveys, but species were noted when detected.

The number of active territories within the survey area was estimated for several special-status species, including, least Bell's vireo, yellow warbler (*Dendroica petechia*), and yellow-breasted chat (*Icteria virens*). Per USFWS survey protocols for this species, active territories (areas defended by the male in which an active nest typically occurs) were counted, at minimum, by a single detection of a singing male. Additional observations beyond simply presence were also noted (e.g., counter-singing with other male; presence of female; nesting activities).

SPECIAL-STATUS AND SENSITIVE SPECIES: CATEGORIES AND DEFINITIONS

Special-status birds include species that have been afforded special recognition by federal, state, or local conservation agencies and organizations principally due to the species' declining or limited population size, usually resulting from habitat loss. In addition to species with state and/or federal legal status as threatened or endangered, various "watch lists" that do not have legal bearing are maintained by the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), Bureau of Land Management (BLM), USDA Forest Service (FS), California Department of Forestry and Fire Protection (CDF), World Conservation Union (IUCN), and groups such as the National Audubon Society (NAS), American Bird Conservancy (ABC), U.S. Bird Conservation (USBC), and various local agencies.

"Special Animals" is a general term that refers to all of the animal taxa that the California Department of Fish and Game's (CDFG's) Natural Diversity Data Base (CNDDB) tracks, regardless of their legal or protection status. These taxa generally fall into one or more of the following categories:

- officially listed species or those proposed for listing under the California or federal Endangered Species Acts;
- State or federal candidates for possible listing;
- taxa which meet the criteria for listing, even if not included on any list, as described in Section 15380 of the California Environmental Quality Act (CEQA) Guidelines;
- taxa considered by CDFG to be a Species of Special Concern (SSC);
- taxa that are biologically rare, very restricted in distribution, declining throughout their range, or that have a critical, vulnerable stage in heir life cycle that warrants monitoring;
- populations in California that may be on the periphery of a taxon's range but threatened with extirpation in California; and
- taxa designated as a special-status, sensitive, or declining species by other state or federal agencies, or non-governmental organizations (NGOs).

Additional information on the CNDDB is available on the CDFG website at http://www.dfg.ca.gov/whdab/html/cnddb.html.

Those agencies and organizations that are tracked by the CNDDB are given and defined below.

Species Protected Under Federal or State Law

Federal Endangered Species Act: A federally **endangered species** is a species of invertebrate, plant, or wildlife formally listed by the USFWS under the federal Endangered Species Act (ESA) as facing extinction throughout all or a significant portion of its geographic range. A federally **threatened species** is one formally listed by the USFWS as likely to become endangered within the foreseeable future throughout all or a significant portion of its range. "Take" of a federally endangered or threatened species or its habitat is prohibited by federal law without a special permit. The term "take", under ESA, means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. Harm is defined by the USFWS to encompass "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 CFR § 17.3). A **proposed threatened or endangered species** is one officially proposed by the USFWS for addition to the federal threatened or endangered species lists.

California Endangered Species Act: A California **endangered species** is one whose prospects of survival and reproduction the California Department of Fish and Game (CDFG) considers to be in immediate jeopardy. A California t**hreatened species** is one present in such small numbers throughout its range in California that the state considers it likely to become an endangered species in the near future in the absence of special protection or management. A **candidate threatened or endangered species** is one officially proposed by the CDFG for addition to the California threatened or endangered species lists. State threatened and endangered species include both plants and wildlife − but do not include invertebrates − and are legally protected against "take" as this term is defined in the California Endangered Species Act (California Fish & Game Code Section 2050 *et seq*.).

Federal and State Resource Conservation Agency Lists of Sensitive Species

U.S. Fish and Wildlife Service: The USFWS maintains a list of **Birds of Conservation Concern (BCC).** The goal of the BCC 2002 report is to accurately identify the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent our highest conservation priorities and draw attention to species in need of conservation action.

Bureau of Land Management: The BLM Manual §6840 defines sensitive species as those species: (1) that are under review by the FWS/NMFS; (2) whose numbers are declining so rapidly that federal listing may become necessary; (3) with typically small and widely dispersed populations; or (4) inhabiting ecological refugia or other specialized or unique habitats. Existing California–BLM policy concerning the designation of sensitive species identifies two conditions that must be met before a species may be considered as BLM sensitive: (1) a significant population of the species must occur on BLM–administered lands, and (2) the potential must exist for improvement of the species' condition through BLM management. It is BLM policy to provide sensitive species within its jurisdiction with the same level of protection that is given federal candidate species.

USDA Forest Service: The USDA Forest Service (FS) defines sensitive species as those plant and animal species identified by a regional forester that are not listed or proposed for listing in the federal Endangered Species Act for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density, or significant current or predicted downward trends in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

California Department of Fish and Game: It is the goal and responsibility of the CDFG to maintain viable populations of all native species. To this end, the CDFG has established and maintains two lists of special-status species, Fully Protected Species and Species of Special Concern.

The classification of **Fully Protected** was the State's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibians, reptiles, birds, and mammals. Most of the species on these lists have subsequently been listed under the state and/or federal endangered species acts; however, a few have not. These are tracked separately in the CNDDB. The Fish and Game Code sections dealing with Fully Protected species state that these species "…may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected" species, although take may be authorized for necessary scientific research. This language arguably makes the "Fully Protected" designation the strongest and most restrictive regarding the "take" of these species. In 2003 the code sections dealing with Fully Protected species were amended to allow the CDFG to authorize take resulting from recovery activities for state-listed species.

CDFG's **Species of Special Concern** is an informal designation used by the CDFG for declining wildlife species that are not officially listed as endangered or threatened. This designation does not provide legal protection but signifies that these species are recognized as vulnerable by CDFG because of declining populations, limited ranges, and/or continuing threats that have made them vulnerable to extinction. The goal of designating species as SSC is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long-term viability. The first list of bird species of special concern was prepared for CDFG by Van Remsen in 1978. In the late 1980s the CDFG commissioned a revised list of bird species of special concern that was ultimately taken up by the Point Reyes Bird Observatory (PRBO) in conjunction with the Department. Although a 2006 draft final report is available online at http://www.dfg.ca.gov/hcpb/bsscrevu/bsscindex.shtml, this most recent list has not replaced the original list, as species no longer considered to be of special concern in the recent list (e.g., Cooper's hawk, Southern California rufous-crowned sparrow) are still listed as Species of Special Concern in the CNDDB's list of "special animals" maintained on its home page at http://www.dfg.ca.gov/hcpb/species/species.shtml.

California Department of Forestry and Fire Protection: The CDF classifies as sensitive those species that warrant special protection during timber operations. The list of CDF sensitive species is given in §895.1 (Definitions) of the California Forest Practice Rules.

Conservation Organization Lists of Sensitive Species

World Conservation Union (IUCN): Through its Species Survival Commission (SSC) the IUCN assesses, on a global scale, the conservation status of species, subspecies, varieties, and selected subpopulations in order to highlight taxa threatened with extinction, and therefore promote their conservation. The SSC is firmly committed to providing the world with the most objective, scientifically-based information on the current status of globally threatened biodiversity.

National Audubon Society: NAS maintains a Watch List of species that are facing population declines and/or threats such as habitat loss on their breeding and wintering grounds, or with limited geographic ranges. The Watch List is a science-based system that focuses attention on at-risk bird species so that limited resources are spent where they are most needed.

American Bird Conservancy: The ABC Green List contains all highest priority birds for conservation in the continental United States and Canada. It builds on the species assessments conducted for many years by Partners in Flight for land birds and expands it to include shorebirds, waterbirds, and waterfowl.

United States Bird Conservation: The USBC Watch List includes the Partners in Flight Watch List, the United States Shorebird Conservation Plan Watch List, and the Waterbird Conservation for the Americas Watch List.

RESULTS

SPECIAL-STATUS BIRDS AND SENSITIVE BIRDS CONSIDERED IN THIS STUDY

Several bird species occurring on or in the vicinity of The Newhall Land and Farming Company property have been classified as "special-status species" by one or more governmental agencies or sensitive by non-governmental conservation organizations. Several other bird species that have not been recorded on the site have the potential to occur. These are discussed below. The locations of observations of special-status avian species (except least Bell's vireo) are depicted in Figure 3. The locations of observations of both common and special-status raptor species, including active nests, are depicted in Figure 4. The locations of active least Bell's vireo territories, as evidenced by the detection of singing males, is depicted in Figure 5.

Black-crowned Night-Heron **Observed**
Nycticorax nycticorax
CONSERVATION STATUS: BLM Sensitive, IUCN Least Concern.
THREATS: Mildly threatened by destruction of trees that support nesting colonies. Also susceptible to nest failure resulting from pesticide-contaminated aquatic food items.
HABITAT: Highly varied; generally found near water, including man-made ditches, canals, and reservoirs. For nesting, trees with dense foliage, often near bodies of water. Nests colonially.
DISTRIBUTION: Widespread throughout North and South American, Europe, Asia, and Africa.
OCCURRENCE ON SITE: Nine observed along the Santa Clara River after dusk on 23 March, and one observed before dawn on 24 March. Several adults and juveniles were detected at various locations along the river, including the Landmark Village impact area. No roost or rookery (nesting colony) was detected on or near the site.

California Condor **Not Observed**
Gymnogyps californianus
CONSERVATION STATUS: Federally Endangered, California Endangered, California Fully Protected, California Department of Forestry and Fire Protection Sensitive, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.
THREATS: Currently, lead poisoning, shooting, contaminant poisoning, and long-term habitat loss.
HABITAT: Remote hilly and mountainous regions with cliff sites for nesting and adequate numbers of deer and livestock to provide carrion food source.
DISTRIBUTION: In historic times, Tehachapi and Greenhorn Mountains, Coast Ranges, and southern Sierra Nevada. Relocation efforts have centered on historical range as well as Grand Canyon of Arizona and in northern Baja California.
POTENTIAL TO OCCUR ON SITE: Re-introduced into the local mountains beginning in 1992 from captive breeding program as part of the California Condor Recovery Program. This wide-ranging species nests on remote cliffs but forages over hundreds of square miles, and is known to at least fly over the site (U.S. Fish and Wildlife Service and Ventana Wilderness Society).

White-tailed Kite **Nests**
Elanus leucurus
CONSERVATION STATUS: California Fully Protected.
THREATS: Loss of habitat due to urbanization, rodenticides, proliferation of highly human-adaptable crows and ravens that may prey on young.
HABITAT: Requires open habitats such as grasslands, croplands and marshes; nests primarily in riparian areas with sycamores, oaks, willows and cottonwoods, and hunts in adjacent open spaces. Nest placement is in crown of tree, often in clump of mistletoe or dense clusters of leaves.
DISTRIBUTION: Uncommon to locally fairly common resident along the coastal slope of California. There has been an apparent geographic range expansion to the north and east in recent decades. Populations declined to very low levels early in the 20th Century but had risen substantially by the mid-1970s. Population sizes locally continue to fluctuate however, perhaps in large part in synchrony with fluctuating cricetine rodent populations. The instability in population sizes indicates that the kites may continue to be affected by human-induced environmental changes in ways that are not fully understood.
OCCURRENCE ON SITE: At least 10 pairs were seen on site early in the season, most of which occurred within the Santa Clara River adjacent to Landmark Village project area. At least three pairs nested on site, 2 of which fall within the impact area. In addition, there was a roost of up to eight individuals in lower Castaic Creek, directly adjacent to Landmark Village impact area.

Northern Harrier **Observed**
Circus cyaneus
CONSERVATION STATUS: California Species of Special Concern, 3rd Priority, IUCN Least Concern.
THREATS: Urbanization of floodplain habitat. In limited remaining nesting habitat in s. California, off-road vehicles, pets, and nest disturbance by man are key threats.
HABITAT: Nests in grasslands, met meadows, fresh- and brackish-water marshes, and forages over a wide variety of open-country habitats including the above, agricultural fields, pastureland, coastal sage scrub and other open scrub communities.
DISTRIBUTION: Throughout most of North America, including all of California below the mountains; however, breeding localities in Southern California are sparse. Now a rare nester in coastal southern California
OCCURRENCE ON SITE: Occurs in winter. Three separate observations of a single male were made at different locations on site on March 10, 18, and 25.

Sharp-shinned Hawk **Not Observed**
Accipiter striatus
STATUS: California Species of Special Concern[1], IUCN Least Concern.
THREATS: Minimal.
HABITAT: Riparian and oak woodlands and coniferous forests.
DISTRIBUTION: Throughout most of North America. In southern California, a fairly common winter visitor in the coastal lowlands and rare summer resident in the mountains No confirmed breeding records south of San Bernardino Mountains.
OCCURRENCE ON SITE: Probably a regular migrant. Unidentified small accipiter seen on March 4, possibly this species.

[1] On the original list of Species of Special Concern (1978) and/or the updated list (1992), but not on the most recent list (2005) that is in final review by CDFG but not yet officially published.

Cooper's Hawk **Nests**
Accipiter cooperii
CONSERVATION STATUS: California Species of Special Concern[1], IUCN Least Concern.
THREATS: Minimal.
HABITAT: Nests primarily in fairly dense oak and riparian woodlands; forages widely in wooded and semi-open areas. Recently has rapidly adapted (commonly nests) to certain, older urban environments with appropriate habitat and prey.
DISTRIBUTION: Throughout most of U. S.. In southern California, fairly common winter visitor and uncommon summer resident west of the deserts.
OCCURRENCE ON SITE: Twelve active territories were located within the survey area, five of which had active nests. It is likely that more territories exist on site. At least 2 territories were detected within Landmark Village impact area.

Swainson's Hawk **Observed**
Buteo swainsoni
CONSERVATION STATUS: California Threatened, USFWS Bird of Conservation Concern, USDA Forest Service Sensitive, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.
THREATS: Loss of nesting and hunting habitat, and recently, high man-caused pesticide mortality on Argentinean wintering grounds.
HABITAT: For breeding, cottonwood riparian, oak, and Joshua tree woodlands adjacent to grasslands. May nest in groves, clumps or lone trees. In migration, often seen in and above open fields.
DISTRIBUTION: Western U.S. and Canada in summer; migrates to South America. In California, breeds locally throughout away from coast, but relatively common only in n. and c. interior.
OCCURRENCE ON SITE: Migrants observed twice - one perched in the agricultural fields within Landmark Village impact area, and one flying high over the site. Does not nest on site.

Ferruginous Hawk **Not Observed**
Buteo regalis
CONSERVATION STATUS: USFWS Bird of Conservation Concern, BLM Sensitive, California Species of Special Concern[1], IUCN LR, National Audubon Society Watch List.
THREATS: Conversion of grassland habitats to agriculture, and on wintering grounds primarily to urbanization.
HABITAT: Nests in lone or small cluster of trees in open flat or rolling terrain with grasslands or shrubs; winters in open grassland and desert areas.
DISTRIBUTION: Nests in Great Plains and Rocky Mountain region from s. Canada to Arizona and New Mexico; winters west and south to California and northern Mexico.
POTENTIAL TO OCCUR ON SITE: Occasional individuals forage on-site in winter, but numbers wintering in the region are relatively low. None were seen during the present survey.

Golden Eagle **Not Observed**
Aquila chrysaetos
CONSERVATION STATUS: USFWS Bird of Conservation Concern, BLM Sensitive, California Fully Protected, California Species of Special Concern[1], California Department of Forestry and Fire Protection Sensitive, IUCN Least Concern. Also protected under the Bald Eagle Act as amended to include Golden Eagle.
THREATS: Human disturbance including encroaching urbanization, shooting, lead poisoning and trapping..
HABITAT: Nests in remote areas in trees, on cliffs, rocky outcrops, and utility towers, mostly in hilly or mountainous terrain.

DISTRIBUTION: Widespread in North America, Europe, and Asia. In California, found nearly throughout except for northwest; becoming increasingly scarce on rapidly developing coastal slope of southern California.
POTENTIAL TO OCCUR ON SITE: Presently, no on-site nests are known. Probably forages on-site and may nest in the local area. On May 28, 2007, one adult was observed 1 mile west of the west end of survey area (Las Brisas bridge), flying south across SR-126 carrying food. One adult was observed in Potrero Canyon on 2 occasions in October 2004 (C. Niemela, pers. obs.).

Merlin **Observed**
Falco columbarius
CONSERVATION STATUS: California Species of Special Concern[1], IUCN Least Concern.
THREATS: Until its ban in the United States, DDT contamination, after which numbers began to increase by themed-1990s.
HABITAT: Forages in open and semi-open areas.
DISTRIBUTION: Nests in the far north, south in the West to Oregon. Winters throughout much of the continental U.S., Mexico, Central, and South America. Also found throughout much of Eurasia.
OCCURRENCE ON SITE: Four observations made between 4 and 23 March. One male and one female were observed hunting over the agricultural fields within Landmark Village impact area; one male was hunting over the alfalfa fields across from the fire station (in close proximity to the proposed utility corridor); one male was perched over an open grassy field adjacent to the river.

Peregrine Falcon **Not Observed**
Falco peregrinus
CONSERVATION STATUS: California Endangered, USFWS Bird of Conservation Concern, USDA Forest Service Sensitive, California Fully Protected, IUCN Least Concern. Formally Federally Endangered but delisted after recovery following ban on DDT use in U.S.
THREATS: Formerly, DDT, egg collecting, shooting.
HABITAT: Cliffs and skyscrapers. for nesting, open landscapes for foraging.
DISTRIBUTION: Nearly cosmopolitan, found on all continents except Antarctica.
POTENTIAL TO OCCUR ON SITE: Likely to occur occasionally in winter and migration. Presently, no nest cliffs are known from the immediate vicinity.

Prairie Falcon **Observed**
Falco mexicanus
CONSERVATION STATUS: USFWS Bird of Conservation Concern, California Species of Special Concern[1], IUCN Least Concern
THREATS: Although more sensitive to effects of DDT, not typically found in areas where DDT use pervasive. Threatened to some degree by agricultural development, urbanization, shooting, and nest disturbance.
HABITAT: Desert mountains and arid mountains and hills west of the desert, rarely to the coast. Ranges over a broader area in winter, but generally not migratory.
DISTRIBUTION: Throughout the western U. S. and California except for the humid northwest.
POTENTIAL TO OCCUR ON SITE: No known aeries in the area; however, it has been recorded foraging on the site in winter. One adult observed on 29 April flying over the site heading north.

Mountain Plover **Not Observed**
Charadrius montanus
CONSERVATION STATUS: USFWS Bird of Conservation Concern, California Species of Special Concern, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.

THREATS: On breeding grounds, conversion of native short-grass prairie habitat to agricultural use and tall grass grazing land, along with nest disturbance from farm machinery have been the major threat. Often, fields suitable for nesting remain fallow until after the nesting season commences, and nests are destroyed when fields are prepared for planting. Re-nesting efforts fail when wheat or other crops become too tall for birds to scan their environment for predators.
HABITAT: Open, flat tablelands and short-grass and intensively grazed prairies. In winter, recently plowed fields, sod farms, heavily grazed grasslands, and burned fields.
DISTRIBUTION: Western Great Plains for breeding, southwestern U.S. and northern Mexico in winter. In s. California, the only winter population centers remaining are in the e. Antelope Valley, the San Jacinto Valley, the Imperial Valley, and the Lower Colorado River Valley.
POTENTIAL TO OCCUR ON SITE: Numbers greatly reduced in last half-century, but recently plowed fields provide ideal foraging habitat in winter and during migration for the few birds that may winter or migrate this close to the coast. Plausible occurrence but not likely.

Long-billed Curlew **Not Observed**
Numenius americanus
CONSERVATION STATUS: USFWS Bird of Conservation Concern California Species of Special Concern[1], IUCN Lower Risk/Near Threatened, National Audubon Society Watch List, American Bird Conservancy Green List.
THREATS: Loss of grassland breeding habitat to agriculture and urbanization; to a lesser extent, loss of coastal wetlands and grasslands in the interior for similar uses.
HABITAT: For nesting, short-grass and mixed prairie with flat to rolling topography. In winter, tidal estuaries and wet meadows and pastures; less often, sandy beaches.
DISTRIBUTION: Nests in northwestern U.S. from Great Basin (east of Cascades) to western Great Plains; winters from U.S. Pacific Coast and California Central Valley to southern Mexico.
POTENTIAL TO OCCUR ON SITE: Agricultural fields and irrigated pastures on the site provide suitable habitat for migrating and possibly wintering birds, but none were documented during the present survey.

Western Yellow-billed Cuckoo **Not Observed**
Coccyzus americanus occidentalis
CONSERVATION STATUS: California Endangered, Federal Candidate for Listing, USFWS Bird of Conservation Concern, USDA Forest Service Sensitive, IUCN Least Concern.
THREATS: Loss of willow and cottonwood riparian forests to agricultural usage and urbanization; pesticide poisoning of prey items.
HABITAT: Large, contiguous patches of willow/cottonwood riparian forests.
DISTRIBUTION: Nests in western U.S.; winters in South America. Unlike its eastern counterpart, the Western Yellow-billed Cuckoo's range is highly restricted and fragmented along portions of watercourses that provide wide floodplains with suitable habitat.
POTENTIAL TO OCCUR ON SITE: Not known to breed in the Santa Clara River drainage, but an occasional bird may appear on-site in migration.

Burrowing Owl **Not Observed**
Athene cunicularia
CONSERVATION STATUS: USFWS Bird of Conservation Concern, BLM Sensitive, California Species of Special Concern, IUCN Least Concern.
THREATS: Loss of suitable habitat from urban development and eradication of ground squirrels that provide burrows.
HABITAT: Inhabits relatively flat and open areas such as grasslands, coastal dunes and agricultural areas; requires the presence of rodent burrows for nesting and roosting activities. Attracted to over-grazed grasslands.

DISTRIBUTION: An uncommon to scarce local resident in southern California; more widespread in winter. Numbers have declined precipitously in past two decades, especially on coastal slope of southern California. Present population centers are in Imperial Valley and Central Valley.
POTENTIAL TO OCCUR ON SITE: Likely resident on-site until a few years ago, but local populations have been declining rapidly. Although ranch hands have reported "ground owls" it may now only be an occasional winter visitor. It was not recorded during the present surveys despite repeated searches during the crepuscular hours when it is most active.

California Spotted Owl **Not Observed**
Strix occidentalis occidentalis
CONSERVATION STATUS: USFWS Bird of Conservation Concern, BLM Sensitive, USDA Forest Service Sensitive, California Species of Special Concern[1], IUCN Lower Risk/Near Threatened, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.
THREATS: Loss of habitat from brush fires, which have increased in number and intensity in recent decades; decreasing supplies of groundwater as human demands increase (adequate groundwater in the dry season and during droughts is necessary to maintain closed-canopy forests).
HABITAT: Evergreen and mixed evergreen-broadleaf woodlands with a closed canopy from 100 to 7,000'.
DISTRIBUTION: Sierra Nevada and southern California mountains and foothills from Monterey County south.
POTENTIAL TO OCCUR ON SITE: Although it occurs in canyons both north and east of the site, dense-canopy woodland habitat is too patchy and sparse on and adjacent to the impact area or project site to support this species. Nocturnal surveys in March did not detect this species.

Long-eared Owl **Not Observed**
Asio otus
CONSERVATION STATUS: California Species of Special Concern, IUCN Least Concern.
THREATS: Loss of riparian habitats and isolated tree groves due to urbanization, flood control, and agriculture, and to a lesser extent shooting and trapping.
HABITAT: Within its southern California range, inhabits riparian woodlands or other groves of trees, typically nesting in oaks. In winter, often roosts in isolated groves of trees with dense foliage.
DISTRIBUTION: Throughout most of U. S. and s. Canada. In southern California, an uncommon resident in the interior and a rare breeder along the coastal slope. Some movement occurs during the winter season, and fairly large concentrations occasionally occur at winter roosting sites. Several successful nests in the Santa Monica Mountains over the last decade (P. Bloom pers. obs.)
POTENTIAL TO OCCUR ON SITE: Good nesting habitat present. May nest on-site in cottonwoods, willows or oaks but was not detected during the present surveys.

Short-eared Owl **Not Observed**
Asio flammeus
CONSERVATION STATUS: California Species of Special Concern, IUCN Least Concern, National Audubon Society Watch List, American Bird Conservancy Green List (nesting), U.S. Bird Conservation Watch List.
THREATS: Degradation and draining of coastal wetlands, conversion of native grasslands to livestock grazing, non-suitable agricultural uses, and urbanization. Also predation and nest disturbance from humans and their pets.
HABITAT: Prairies, grasslands, marshes, and agricultural areas supporting cyclic rodent populations. Nests on ground on (in wet areas) slightly raised, dry sites with concealing vegetation.
DISTRIBUTION: Nearly cosmopolitan. In North America, nests primarily from central states north, but locally in West. In California, it nests primarily in the northern half of the state, formerly south to s.

California. While it does breed in a few places in southern California, it is not know to breed in the Santa Clara River Valley.
POTENTIAL TO OCCUR ON SITE: Recorded occasionally but not during current survey period. One specimen was found on the Castaic Junction site, within the study area and adjacent to the proposed utility corridor, on 27 December, 2006 (D. Cooper pers. comm.). No breeding habitat is available, so occurrence would be only outside the breeding season.

Costa's Hummingbird **Not Observed**
Calypte costae
CONSERVATION STATUS: IUCN Least Concern, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.
THREATS: Loss of native vegetation to urbanization, agriculture, and flood control, and in Mexico, to planting of South African buffelgrass (*Cenchrus ciliaris*) for cattle forage. This species has actually expanded its range and seasonal presence in coastal southern California with the proliferation of exotic flowering plants associated with urbanization. This has apparently offset any loss in numbers due to loss of native habitats, such as coastal sage scrub, in this region.
HABITAT: Desert scrub, coastal sage scrub, and other arid shrublands.
DISTRIBUTION: Southwestern U.S., Baja California, and nw. Mexico.
POTENTIAL TO OCCUR ON SITE: Undoubtedly occurs as a migrant and may breed in sage scrub- and chaparral-covered hillsides south of site, but not observed during current survey period.

Rufous and Allen's Hummingbird **Observed**
Selasphorus rufus and sasin
CONSERVATION STATUS: USFWS Bird of Conservation Concern (*rufus* only), IUCN Least Concern, National Audubon Society Watch List, American Bird Conservancy Green List. (*rufus* only), U.S. Bird Conservation Watch List.
THREATS: For Allen's, perhaps its competitive disadvantage with the larger Anna's Hummingbird (*Calypte anna*), but its range has been expanding rapidly in recent decades due to extensive landscaping in urban areas with suitable exotic flowering plants, including especially eucalyptus and tree-tobacco (*Nicotiana glauca*). For Rufous, threats from habitat loss, increases in predation by cats, and other human activities appear to be offset by expansion of food sources through planting of exotics and proliferation of artificial food sources such as hummingbird feeders.
HABITAT: For Rufous, secondary succession forested and brushy communities created after fires and logging. For Allen's, shrublands and open woodlands in moist, narrow coastal belt affected by summer fogs.
DISTRIBUTION: Rufous breeds west of the Continental Divide from Alaska to Oregon and extreme nw. California and winters in Mexico. Allen's breeds along and near the coast from s. Oregon to s. California; most winter in sc. Mexico.
OCCURRENCE ON SITE: Two unidentified Selasphorus hummingbirds were seen on the site, one on 24 March and one on 1 April. A few of both species undoubtedly use the site during migration.

Nuttall's Woodpecker **Nests**
Picoides nuttallii
CONSERVATION STATUS: IUCN Least Concern, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.
THREATS: Loss of preferred habitat due to flood control, urbanization, and agriculture.
HABITAT: Oak and riparian woodlands.
DISTRIBUTION: Coastal slope of California and nw. Baja California.
OCCURRENCE ON SITE: Common resident in cottonwood and willow riparian habitat along Santa Clara River, Castaic Creek, and other tributaries, and in coast live oak woodlands in adjoining canyons. Three to 14 recorded daily. Several territories occur within the Landmark Village impact area.

Willow Flycatcher, including Southwestern Willow Flycatcher **Observed**
***Empidonax traillii* (including *extimus*)**
CONSERVATION STATUS: Federally Endangered (*extimus* only), California Endangered (all subspecies that breed in the state), USDA Forest Service Sensitive, IUCN Least Concern, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List. Continues to decline in California.
THREATS: Brown-headed Cowbird (*Molothrus ater*) nest parasitism and loss of habitat from urbanization, agriculture, and flood control.
HABITAT: Willow riparian woodlands.
DISTRIBUTION: Northern half of U.S. and s. Canada for breeding; Central and n. South America in winter. In California, Siera Nevada (*brewsteri*) and scattered localities in s. half of state (*extimus*).
OCCURRENCE ON SITE: The federally endangered *E. t. extimus* is the subspecies that breeds locally. Suitable habitat occurs on site, and surveys are currently being conducted to determine if the species breeds on site. Migrants of other subspecies protected under the California ESA are likely to occur in riparian areas in spring and fall. Several adult willow flycatchers have been observed foraging in riparian areas on site as of June 12, though none are confirmed breeders. Two of these observations fall directly adjacent to the western end of Landmark Village impact area. One pair was observed foraging in the San Francisquito Conservation Easement Area on June 12.

Loggerhead Shrike **Nests**
Lanius ludovicianus
CONSERVATION STATUS: USFWS Bird of Conservation Concern, California Species of Special Concern, IUCN Least Concern.
THREATS: Because this species has declined so rapidly, not just in urbanized areas but throughout vast regions, the factors affecting it and their scale are unclear. Loss, fragmentation, and degradation of habitat, and the trend toward extensive areas of monoculture cultivation and associated heavy use of pesticides, coupled with the fact that it is a predator with inherently low densities have all undoubtedly contributed to its decline but are not the sole cause., although is likely to be a contributing factor.
HABITAT: Generally occupies open habitats with scattered large shrubs, trees, or fencelines.
DISTRIBUTION: Formerly occurred commonly throughout the U.S., s. Canada, and n. Mexico. Now absent from whole regions, especially in the northern states, and greatly reduced in others. Has decreased rapidly in s. California w. of the deserts since the mid-1980s, a pattern consistent with populations elsewhere in the U. S., and is now threatened with extirpation from the region. Still common, however, in the deserts.. Shrikes had become scarce in the Northeast as early as the 1960s and in the Southeast by the late 1970s. In some states where they were once common, they are now virtually extirpated.
OCCURRENCE ON SITE: Resident on-site. Two were observed during the present survey on 4 March – one in Potrero Canyon and the other in an agricultural field along the river. None were detected within the Landmark Village impact area.

Least Bell's Vireo **Nests**
Vireo bellii pusillus
CONSERVATION STATUS: California Endangered, USFWS Bird of Conservation Concern, IUCN Lower Risk/Near Threatened, National Audubon Society Watch List, U.S. Bird Conservation Watch List.
THREATS: Brown-headed Cowbird nest parasitism and loss of habitat from urbanization, agriculture, and flood control.
HABITAT: Willow riparian woodlands.
DISTRIBUTION: Coastal s. California, nw. Baja California, and formerly, the Central Valley. Winters in Mexico.
OCCURRENCE ON SITE: Breeds in willow riparian habitat along the Santa Clara River. The earliest observation of a singing male was on 24 March. Based on observations from April 18 through June 15,

approximately 56 territories occur along the Santa Clara River and adjacent floodplains from Interstate 5 bridge west to Las Brisas bridge. Greater than ¾ of the territories occur west of Wolcott Rd crossing. At least 19 territories occur within or directly adjacent to Landmark Village impact area (Figure 5).

California Horned Lark **Observed**
Eremophila alpestris actia
CONSERVATION STATUS: California Species of Special Concern[1], IUCN Least Concern.
THREATS: Loss and fragmentation of native grassland and coastal sage scrub habitat to urbanization, croplands, and livestock grazing; increased predation from house pets.
HABITAT: Areas of short vegetation and bare ground, including sparsely vegetated coastal sage scrub.
DISTRIBUTION: San Joaquin Valley and coastal slope of s. California.
OCCURRENCE ON SITE: Found in winter in agricultural fields. Several individuals were heard or seen in the agricultural fields in March. A flock of approximately 20 individuals was observed foraging in a dirt agricultural field within the Landmark Village impact area on June 13, 2007.

Purple Martin **Not Observed**
Progne subis
CONSERVATION STATUS: California Species of Special Concern, IUCN Least Concern.
THREATS: Competition for nest sites with the non-native European Starling (*Sturnus vulgaris*).
HABITAT: Holes in prominent, isolated trees for nesting.
DISTRIBUTION: Widespread in e. United States; in the west confined to s. Rocky Mountains, coastal slope and locally in the Sierra Nevada and Cascade ranges.
POTENTIAL TO OCCUR ON SITE: Likely to occur only rarely as a migrant. The closest known breeding population is in the extensive oak woodlands of the Tejon Ranch.

Bank Swallow **Not Observed**
Riparia riparia
CONSERVATION STATUS: California Threatened, IUCN Least Concern.
THREATS: Flood control measures to stabilize river banks.
HABITAT: For breeding, "soft" vertical sandstone banks and cliffs of sand (including seaside cliffs), sandy loam, or clay, usually over water.
DISTRIBUTION: Throughout most of the Northern Hemisphere in summer; migrates to South America in winter. In California, now restricted to the northern part of the state; no known breeding colonies remain in southern California.
POTENTIAL TO OCCUR ON SITE: Potentially as an occasional migrant.

Oak Titmouse **Nests**
Baeolophus inornatus
CONSERVATION STATUS: IUCN Least Concern, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.
THREATS: Loss of oak woodland and riparian habitats has been correlated with declines in some regions.
HABITAT: Primarily oak woodlands, but also elsewhere where there are trees, including some exotic species in urban areas.
DISTRIBUTION: California's coastal slope and Central Valley south to nw. Baja California.
OCCURRENCE ON SITE: Abundant resident in cottonwood riparian and coast live oak communities. Two to 14 recorded daily.

Coastal California Gnatcatcher **Not Observed**
Polioptila californica californica
CONSERVATION STATUS: Federally Threatened, California Species of Special Concern[1], IUCN Least Concern, Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservancy Watch List.
THREATS: Brown-headed Cowbird nest parasitism and loss and fragmentation of habitat.
HABITAT: Coastal sage scrub.
DISTRIBUTION: Coastal slope of California from e. Ventura County to s. Baja California. California populations have sometimes been considered to constitute a separate subspecies, *P. c. californica*, the Coastal California Gnatcatcher.
POTENTIAL TO OCCUR ON SITE: No historical records from the immediate area, although suitable habitat is present. Formerly bred near Santa Paula about 25 miles west of the property and may have bred more recently in the Santa Clarita area, but now likely extirpated from the Santa Clara River watershed. Coastal sage scrub was not extensively surveyed during these surveys.

California Thrasher **Nests**
Toxostoma redivivum
CONSERVATION STATUS: IUCN Least Concern, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.
THREATS: Loss of habitat.
HABITAT: Chaparral, coastal sage scrub, riparian woodlands with sufficient understory vegetation.
DISTRIBUTION: Sierra Nevada foothills and coastal slope of California and nw. Baja California.
OCCURRENCE ON SITE: Common resident in sage scrub and chaparral community south of the Santa Clara River. These habitat communities were not extensively covered during these surveys. One to 4 recorded most days.

Yellow Warbler **Nests**
Dendroica petechia brewsteri* and *D. P. morcomi
CONSERVATION STATUS: California Species of Special Concern, IUCN Least Concern.
THREATS: Loss of riparian habitat to flood control, agriculture, and urbanization.
HABITAT: Wet, deciduous thickets, especially those dominated by willows.
DISTRIBUTION: Coastal slope of Washington, Oregon, and California (*brewsteri*) and from nw. Canada south though e. California to n. Texas (*morcomi*). Winters south of the U.S.
OCCURRENCE ON SITE: On-site habitat quality in and adjacent to the river channel is excellent and supports many breeding pairs from April through August. The earliest arriving male was heard singing on 30 March. Based on observations from April 18 through June 15, approximately 98 territories occur along the Santa Clara River and adjacent floodplains from the Bouquet Canyon Road bridge west to Las Brisas bridge. All but 14 territories occur west of Interstate 5 bridge, and many fall within the Landmark Village impact area.

Yellow-breasted Chat **Nests**
Icteria virens
CONSERVATION STATUS: California Species of Special Concern, IUCN Least Concern.
THREATS: Loss of riparian thicket habitat due to flood control, agriculture, livestock grazing, and urban development.
HABITAT: For breeding, riparian scrub and woodland with dense cover; occasionally in non-riparian dense scrub.
DISTRIBUTION: Throughout much of North America in summer. In California, breeds nearly throughout in appropriate habitat. Winters in Mexico and Central America.
OCCURRENCE ON SITE: Breeds on-site in thickets along the Santa Clara River. Based on observations from April 18 through June 15, approximately 35 territories occur along the Santa Clara River and

adjacent floodplains from the Interstate 5 bridge west to Las Brisas bridge. One territory was located along the river on the east side of Interstate 5. At least six territories occur within or directly adjacent to Landmark Village impact area.

Summer Tanager **Not Observed**
Piranga rubra
CONSERVATION STATUS: California Species of Special Concern, IUCN Least Concern.
THREATS: Loss of native riparian habitat along Colorado River primarily due to flood control (primarily dam building) has virtually eliminated the California breeding population; however, a concomitant colonization of desert oases in recent years, many of which have been man-created and maintained, has served to offset this decline. Nevertheless, clearing, burning, off-road vehicles, excessive groundwater pumping, and invasion of exotic plants are all continuing threats.
HABITAT: Mature riparian woodlands.
DISTRIBUTION: The western subspecies *P. r. cooperi* breeds from w. Texas to s. California. Winters from Mexico to n. South America.
POTENTIAL TO OCCUR ON SITE: Not known to breed within the Santa Clara River watershed, but could be found on the site occasionally in migration.

Southern California Rufous-crowned Sparrow **Nests**
Aimophila ruficeps canescens
CONSERVATION STATUS: California Species of Special Concern[1], IUCN Least Concern.
THREATS: Loss and fragmentation of coastal sage scrub due primarily to urbanization.
HABITAT: Chaparral, especially that regenerating from brush fires, and coastal sage scrub.
DISTRIBUTION: Coastal slope of California and n. Baja California.
OCCURRENCE ON SITE: Fairly common resident in sage scrub and chaparral. Six individuals observed over 6 survey days in March.

Chipping Sparrow **Observed**
Passerina spizella
CONSERVATION STATUS: IUCN Least Concern
THREATS: The USFWS Breeding Bird Survey suggests a significant decrease in California populations, although other studies and anecdotal evidence does not necessarily support this. Some decline may be attributed to Brown-headed Cowbird nest parasitism.
HABITAT: A variety of open woodland types with grassy understory. In California, primarily in open grassy coniferous forests, oak woodlands and savannas, and orchards.
DISTRIBUTION: Widespread throughout most of North America. Also, throughout California away from the deserts and lower elevations of the Central Valley. Winters in s. U.S. and Mexico.
OCCURRENCE ON SITE: Common migrant. One to 12 individuals seen most days in early March around edges of agricultural fields.

Black-chinned Sparrow **Not Observed**
Spizella atrogularis
CONSERVATION STATUS: USFWS Bird of Conservation Concern, IUCN Least Concern, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.
THREATS: USFWS Breeding Bird Survey data show significant population declines in California from 1966 to 1991; however, it is unclear whether these declines reflect habitat loss or are an artifact of cyclic population fluctuations that are characteristic of this species. It nests on rugged hillsides generally out of the reach of urban sprawl, but not always out of reach of livestock grazing.
HABITAT: Rugged, often boulder-strewn hillside chaparral and sage scrub communities, often most common in areas regenerating from brushfires.

DISTRIBUTION: Southeastern U.S. and Mexico. Winters mostly s. of U.S.
POTENTIAL TO OCCUR ON SITE: Likely to occur as a migrant on sage scrub- and chaparral-covered hillsides. A few may remain to breed on more rugged slopes.

Bell's Sage Sparrow **Not Observed**
Amphispiza belli belli
CONSERVATION STATUS: USFWS Bird of Conservation Concern, California Species of Special Concern[1], IUCN Least Concern.
THREATS: Long-term fire suppression and habitat loss due to urbanization. More sensitive to habit fragmentation than most species.
HABITAT: Chamise chaparral and coastal sage scrub, especially in mid-regeneration stages following fire.
DISTRIBUTION: Coastal slope of California and n. Baja California.
POTENTIAL TO OCCUR ON SITE: Resident in chamise-dominated chaparral and in sage scrub along ridgelines throughout much of Santa Clara Valley but not detected in the present survey which extended only marginally into typical sage sparrow habitat on the higher slopes and ridgelines.

Tricolored Blackbird **Not Observed**
Agelaius tricolor
CONSERVATION STATUS: USFWS Bird of Conservation Concern, California Species of Special Concern, IUCN Least Concern, Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.
THREATS: Loss of habitat due to flood control, draining of wetlands, agriculture, and urbanization.
HABITAT: For breeding, freshwater marshes dominated by cattails (*Typha* spp.) and bulrushes (*Scirpus* spp.), and to a lesser extent, willows (*Salix* spp.). For foraging, grasslands and agricultural fields.
DISTRIBUTION: Central Valley and coastal slope of California, and locally in Oregon and Washington.
POTENTIAL TO OCCUR ON SITE: Suitable breeding habitat exists near, and perhaps on, the site. Nesting birds have been reported from nearby Salt Creek as recently as 2003. It has been documented foraging in blackbird flocks in the agricultural fields in winter, but none were seen during the current survey. All wetlands and grassland habitats that might support breeding populations of this species will be examined in spring 2007.

Yellow-headed Blackbird **Observed**
Xanthocephalus xanthocephalus
CONSERVATION STATUS: IUCN Least Concern.
THREATS: Loss of habitat due to flood control, draining of wetlands, agriculture, and urbanization.
HABITAT: For breeding, wetlands associated with parklands, mountain meadows, and arid regions. In winter, harvested and plowed agricultural fields, ranchlands, and farmyards.
DISTRIBUTION: Central and Western U.S. and s. Canada. Winters in sc. U.S. and Mexico.
OCCURRENCE ON SITE: A few undoubtedly occur on site in wintering flocks of blackbirds. One individual was seen in a flock of red-winged blackbirds in the agricultural fields on 1 April, 2007.

Lawrence's Goldfinch **Observed**
Carduelis lawrencei
CONSERVATION STATUS: USFWS Bird of Conservation Concern, IUCN Least Concern, National Audubon Society Watch List, American Bird Conservancy Green List, U.S. Bird Conservation Watch List.
THREATS: No clear threats have been identified other than loss of habitat to urbanization; however, planting of shade trees and habitat alterations such as grazing, non-intensive agriculture, and fire resulting in an increase in favored annual seed plants have likely benefited this species.
HABITAT: Open woodlands near chaparral or coastal sage scrub, tall annual weed fields, and water.

DISTRIBUTION: California west of the Sierra Nevada and n. Baja California.
OCCURRENCE ON SITE: Common migrant throughout and fairly common resident in oak woodlands. Two to 70 recorded daily throughout March, mostly in migrant flocks.

SUMMARY

Of the 41 special-status species discussed, 21 were observed in the survey area during the present survey period, 10 of which currently nest in the survey area (Table 1). An additional seven species have been known to occur within or near the survey area, but were not observed during the current surveys. Most of the 21 species observed were species with informal and relatively low level sensitivity status (i.e., "Watch List" species). However, the Least Bell's Vireo (*Vireo bellii pusillus*) is a California Threatened species that breeds in the survey area, and the Swainson's Hawk (*Buteo swainsoni*) is a California Threatened species that occasionally forages in the survey area during migration. All special-status species that were observed within the survey area are listed in Table 1.

Special-status species that were detected within the Landmark Village project impact area include black-crowned night-heron, white-tailed kite, northern harrier, Cooper's hawk, Swainson's hawk, merlin, Nuttall's woodpecker, willow flycatcher, least Bell's vireo, California horned lark, oak titmouse, yellow warbler, yellow-breasted chat, yellow-headed blackbird, and Lawrence's goldfinch. Seven of these species nest within the Landmark Village impact area, including white-tailed kite, Cooper's hawk, Nuttall's woodpecker, least Bell's vireo, oak titmouse, yellow warbler, and yellow-breasted chat. Other special-status species that nest in the survey area, but outside of the Landmark Village impact area include loggerhead shrike, California thrasher, and rufous-crowned sparrow.

Raptor species that nested within or directly adjacent to the Landmark Village impact area include white-tailed kite, red-shouldered hawk, red-tailed hawk, Cooper's hawk, western screech owl, and barn owl. Great-horned owls were also detected within the impact area, and although no nest was found it is highly likely that they do nest. Other raptor species that were detected within the impact area include merlin, and Swainson's hawk, both of which are migrants, and northern harrier, which is a local breeder and has the potential for nesting on site.

Burrowing owls were not detected on site during fairly intensive surveys in March of suitable habitat in and around the agricultural fields and pastures in the survey area. Historically, the species undoubtedly bred on the property, but numbers have declined dramatically throughout most of its range in California other than in the Imperial Valley, where it remains relatively common, and in portions of the Central Valley. Since the species is partially migratory, non-breeding migrants may be expected on the property during spring and fall migration and in winter; however, none were detected during the March surveys.

Long-eared owls were not detected on site during the current surveys, although due to the difficulty in detecting this species, is it still possible that it may occur in the survey area. Long-eared owls utilize nests of American crow, Cooper's hawk, common raven, and red-shouldered hawk, all of which currently nest in the survey area in appropriate long-eared owl habitat. Outside the nesting season, Long-eared Owls roost in groves of cottonwoods, oaks, and conifers with dense foliage.

Wading birds, including black-crowned night heron, green heron, snowy egret, great egret, and great blue heron, were detected at various points along the entire stretch of the Santa Clara River within the survey area. No least bitterns were detected on site. Adult and juvenile black-crowned night herons were frequently flushed along the river during nighttime toad surveys. No heron roosts or rookeries have been detected in the survey area.

TABLE 1
SPECIAL-STATUS BIRDS DOCUMENTED IN THE SURVEY AREA AND NEAR VICINITY

Species	Status	Observed on site, 2007	Nesting on site, 2007	California Endangered	California Threatened	Fully Protected	Species of Special Concern	Bird of Conservation Concern	BLM Sensitive	USDA Forest Service	IUCN	Nat'l Audubon Society	Amer Bird Conservancy	U.S. Bird Conservation
Black-crowned Night-Heron	resident?	X							X		LC			
California Condor	fly-over			X		X						X	X	X
White-tailed Kite	yr-round resident	X	X			X								
Northern Harrier	winter visitor	X					3				LC			
Sharp-shinned Hawk	winter						F				LC			
Cooper's Hawk	yr-round resident	X	X				F				LC			
Swainson's Hawk	migrant	X			X			X		X		X	X	X
Ferruginous Hawk	winter visitor						F	X	X		LR			
Golden Eagle	migrant/resident?					X	1	X	X		LC			
Merlin	winter visitor	X					F				LC			
Prairie Falcon	winter visitor	X					F	X			LC			
Burrowing Owl	winter visitor						2	X	X		LC			
Short-eared Owl	winter visitor						3				LC			
Selasphorus hummingbird	migrant	X						X			LC	X	X	X
Nuttall's Woodpecker	yr-round resident	X	X								LC	X	X	X
Willow Flycatcher	migrant	X			X					X	LC	X	X	
Loggerhead Shrike	yr-round resident	X	X				2	X			LC			
Least Bell's Vireo	summer resident	X	X	X				X			LR	X		X
Horned lark	winter visitor	X					F				LC			
Oak Titmouse	yr-round resident	X	X								LC	X	X	X
California Thrasher	yr-round resident	X	X								LC	X	X	X
Yellow Warbler	summer resident	X	X				2				LC			
Yellow-breasted Chat	summer resident	X	X				3				LC			
Rufous-crowned Sparrow	yr-round resident	X	X				F				LC			
Chipping Sparrow	migrant	X									LC			
Tricolored Blackbird	yr-round resident						1	X			LC	X	X	X
Yellow-headed Blackbird	winter visitor	X					3				LC			
Lawrence's Goldfinch	yr-round resident	X						X			LC	X	X	X

Species of Special Concern: F = former; 1 = 1st Priority; 2 = 2nd Priority; 3 = 3rd Priority
IUCN: LR = Low Risk/Near Threatened; LC = Least Concern

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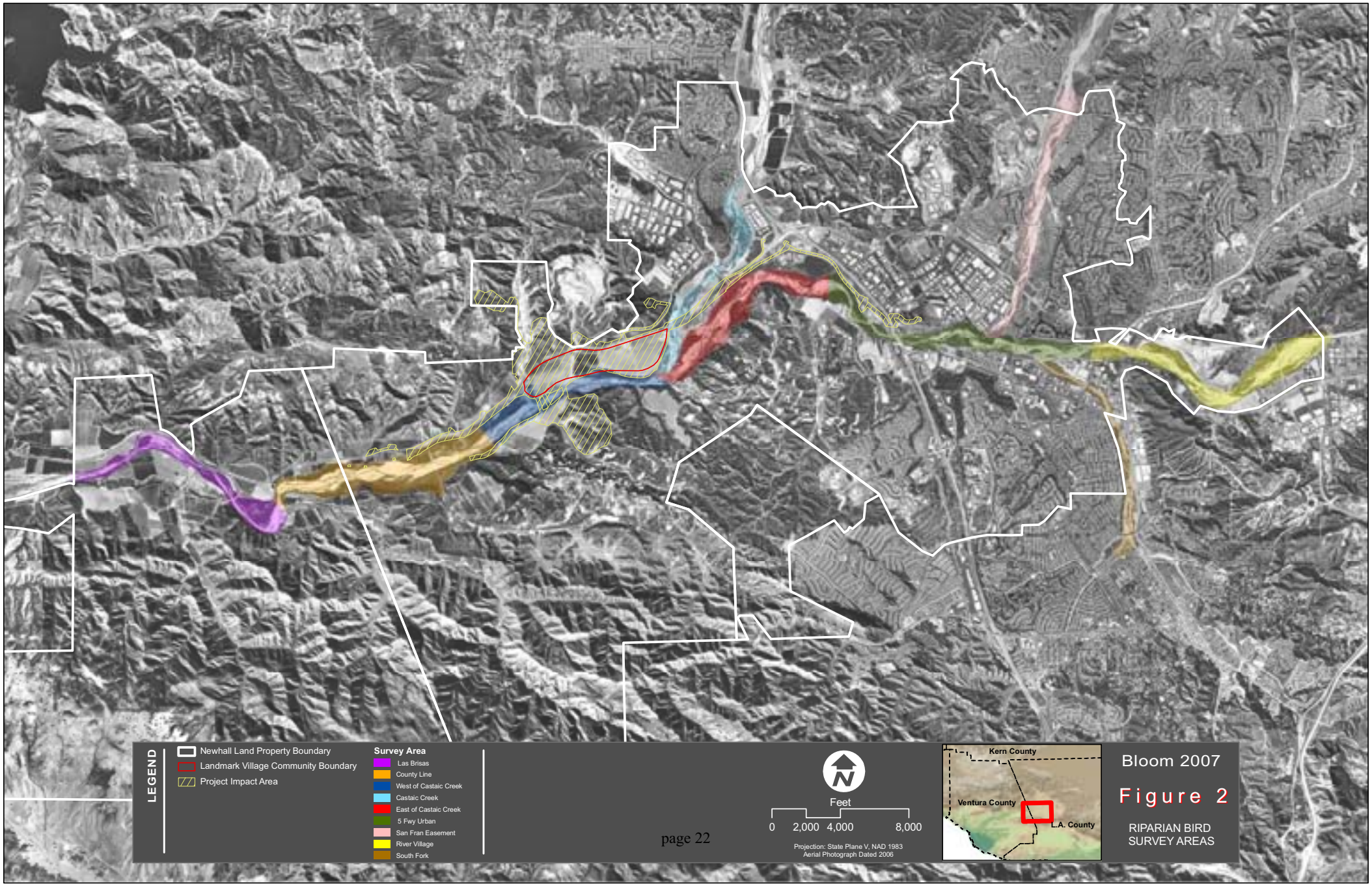
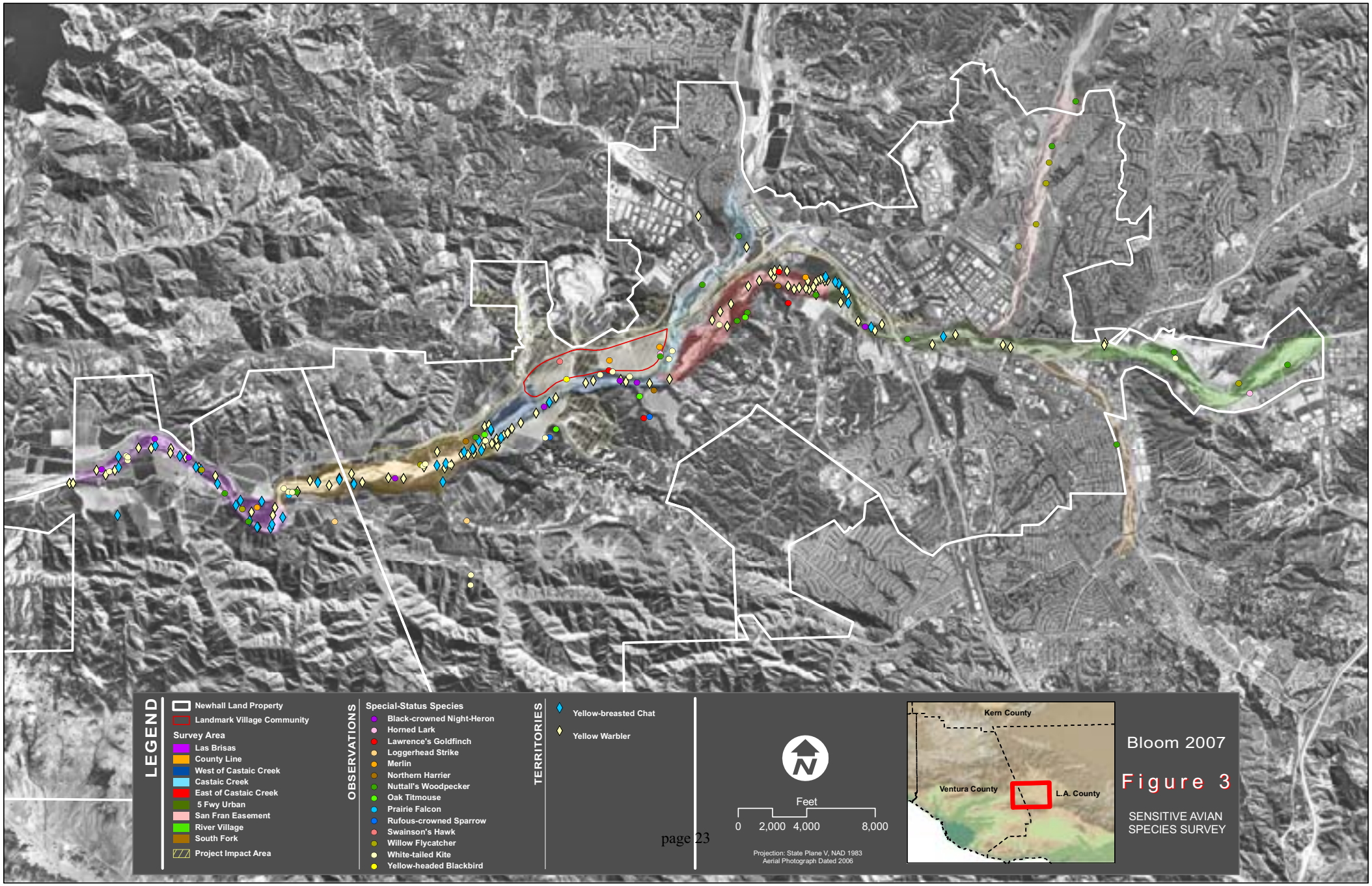
LEGEND
Newhall Land Property Boundary
Landmark Village Community Boundary
Project Impact Area
N
Feet
0
2,000
4,000
8,000
Projection: State Plane V, NAD 1983
Aerial Photograph Dated 2006
Kern County
Ventura County
L.A. County
Bloom 2007
Figure 1
LANDMARK VILLAGE
PROJECT IMPACT AREA


LEGEND
Newhall Land Property Boundary
Landmark Village Community Boundary
Project Impact Area
Survey Area
Las Brisas
County Line
West of Castaic Creek
Castaic Creek
East of Castaic Creek
5 Fwy Urban
San Fran Easement
River Village
South Fork
Feet
0 2,000 4,000 8,000
Projection: State Plane V, NAD 1983
Aerial Photograph Dated 2006
Kern County
Ventura County
L.A. County
Bloom 2007
Figure 2
RIPARIAN BIRD
SURVEY AREAS


LEGEND
Newhall Land Property
Landmark Village Community
Survey Area
Las Brisas
County Line
West of Castaic Creek
Castaic Creek
East of Castaic Creek
5 Fwy Urban
San Fran Easement
River Village
South Fork
Project Impact Area
OBSERVATIONS
Special-Status Species
Black-crowned Night-Heron
Horned Lark
Lawrence's Goldfinch
Loggerhead Strike
Merlin
Northern Harrier
Nuttall's Woodpecker
Oak Titmouse
Prairie Falcon
Rufous-crowned Sparrow
Swainson's Hawk
Willow Flycatcher
White-tailed Kite
Yellow-headed Blackbird
TERRITORIES
Yellow-breasted Chat
Yellow Warbler
N
Feet
0 2,000 4,000 8,000
Projection: State Plane V, NAD 1983
Aerial Photograph Dated 2006
Kern County
Ventura County
L.A. County
Bloom 2007
Figure 3
SENSITIVE AVIAN SPECIES SURVEY

LEGEND
Focused Raptor Survey Area
Newhall Land Property
Landmark Village Community
Project Impact Area
ACTIVE TERRITORIES
SPECIES
Barn Owl
Cooper's Hawk
Great-horned Owl
Red-shouldered Hawk
Red-tailed Hawk
Western Screech Owl
White-tailed Kite
ACTIVE NESTS
SPECIES
American Kestrel
Barn Owl
Cooper's Hawk
Great-horned Owl
Red-shouldered Hawk
Red-tailed Hawk
White-tailed Kite
SINGLE OBSERVATIONS
SPECIES
Merlin
Northern Harrier
Prairie Falcon
Swainson's Hawk
N
Feet
0 2,000 4,000 8,000
Projection: State Plane V, NAD 1983
Aerial Photograph Dated 2006
Kern County
Ventura County
L.A. County
Bloom 2007
Figure 4
RAPTOR SURVEY

Bloom 2007

Figure 5

LEAST BELL'S VIREO SURVEY

DRAFT

LANDMARK VILLAGE BIOTA REPORT
LOS ANGELES COUNTY, CALIFORNIA

VOLUME I OF IV

County Project No. 00-196
Vesting Tentative Tract Map No. 53108

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1.0 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This document identifies and analyzes potential impacts to the biological resources associated with the Landmark Village project, which is the first proposed subdivision within the Riverwood Village portion of the approximately 11,963-acre Newhall Ranch Specific Plan. The Specific Plan was approved by the Board of Supervisors of the County of Los Angeles (County) on May 27, 2003. The Landmark Village project is proposed on 292.6 acres of land, located within the boundaries of the approved Specific Plan. To facilitate development of this site, several off-site, project-related components would be implemented on an additional 679.2 acres of land within the boundaries of the approved Specific Plan. These project-related components include:

(1) a cut and fill grading operation, which includes fill imported to the Landmark Village tract map site from a 215-acre borrow site located south of the Santa Clara River, and grading to accommodate improvements to State Route 126 (SR-126) adjacent to the tract map site and debris basins for stormwater flows collected by the project's storm drainage system on approximately 120 acres of land, located off site directly north of SR-126 within Chiquito Canyon (and related haul routes);

(2) a 110-acre underground utility corridor proposed along the south side of SR-126 extending from the Valencia Water Reclamation Plant (WRP) (Plant 32) on the east to the proposed Newhall Ranch WRP on the west, which would serve to extend municipal services to the tract map site;

(3) two separate water tank sites, one within the Valencia Commerce Center and another within the proposed borrow site, to convey potable water to the tract map site;

(4) two reclaimed water tanks proposed off site in Chiquito Canyon to implement a portion of the Specific Plan's reclaimed water storage and distribution system; and

(5) construction of the Long Canyon Road Bridge, approximately 17,700 linear feet of associated bank stabilization and storm drainage improvements.

For the purposes of this report, the "tract map site" refers only to the proposed location of the Landmark Village development site itself, and the "project site" includes the tract map site, plus the borrow site, the Chiquito Canyon grading site, the utility corridor, the potable and reclaimed water tank sites, the Long Canyon Road Bridge, bank stabilization, drainage improvements and related haul routes (on a total of 971.8 acres). The project site is discussed in detail in **Section 2.0, Project Description**.

When a project is proposed within or adjacent to a County-designated Significant Ecological Area (SEA), the County's Department of Regional Planning (Department) requires the preparation of both a Biological Constraints Analysis (BCA) and a separate Biota Report, which are to be reviewed by the Significant Ecological Areas Technical Advisory Committee (SEATAC). Portions of the Landmark Village project

site are adjacent to or are within the Specific Plan's River Corridor Special Management Area (SMA)/Significant Ecological Area 23 (SEA 23) boundaries. Given that the Board of Supervisors already approved the Newhall Ranch Specific Plan and WRP, including SEA Conditional Use Permit (CUP) No. 94-087-(5), the Department has directed that this document serve as both the BCA and Biota Report for the Landmark Village project site. The Department's direction is provided because of the following:

(1) the Newhall Ranch Specific Plan area, including the project site, has been analyzed from a biological perspective in the previously certified Newhall Ranch Program Environmental Impact Report (EIR) for the Newhall Ranch Specific Plan and WRP (SCH No. 1995011015), dated March 8, 1999, (see Section 4.6, Biota), the related Biota Report, dated July 1996 (see Draft Program EIR, Volume III, Appendix 4.6) and the Newhall Ranch Revised Additional Analysis, Volume VIII, dated May 2003; and

(2) SEATAC already conducted extensive reviews of the previously submitted Newhall Ranch BCA, Biota Report, draft environmental documentation and portions of the Newhall Ranch Specific Plan.[1] SEATAC's review dates on the Newhall Ranch Specific Plan were December 5, 1994; October 2, 1995; November 6, 1995; December 4, 1995; January 8, 1996; May 6, 1996; and June 3, 1996.

The Department considers the previously certified Program EIR and Biota Report to be a sufficient baseline analysis of impacts to biological resources associated with development of the Newhall Ranch Specific Plan and WRP. As such, the Department has directed the preparation of this document as the Biota Report required to be submitted to SEATAC for its review, comments and recommendations with the overriding criteria that overall conclusions and findings regarding impacts on biological resources be consistent with those found in the certified Program EIR and Biota Report for the Newhall Ranch Specific Plan and WRP. The Department has also directed that this document be prepared in a manner that satisfies SEATAC's format and content guidelines.

1.2 BACKGROUND

On May 27, 2003, the Los Angeles County Board of Supervisors certified the Newhall Ranch Program EIR and Final Additional Analysis for the Newhall Ranch Specific Plan and WRP. At that time, the Board also adopted several project approvals, including the Newhall Ranch Specific Plan and construction of the Newhall Ranch WRP. Other project approvals included (a) General Plan and Sub-Plan Amendment Nos. 94-087-(5); (b) Zone Change No. 94-087-(5); (c) Vesting Tentative Parcel Map No. 24500; and (d) SEA CUP No. 94-087-(5) for boundary adjustments to, and development within, SEA 20 and SEA 23. Finally, the Board adopted environmental findings and revised Mitigation Monitoring Plans for the Specific Plan, WRP, and the related approvals.

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1 Please see Newhall Ranch Draft EIR, Volume III, July 1996, Appendix O, for copies of the SEATAC meeting minutes, reports, comments and responses to SEATAC comments.

As part of the Board of Supervisors' project approvals for the Specific Plan, the previously adopted SEA CUP No. 94-087-(5) and General Plan Amendment authorized, among other things, (1) boundary adjustments to the existing SEA 23, consistent with General Plan policies requiring protection of natural resources within SEAs; and (2) Specific Plan development within SEA boundaries, including bridge crossings (i.e., Long Canyon Road Bridge, Commerce Center Drive Bridge and the Potrero Road Bridge), trails, bank stabilization and other improvements. The approved SEA boundary adjustments were found to be consistent with the adopted Specific Plan, which established a Specific Plan "SMA" designation over the adjusted SEA 23 boundaries. Although the adjusted boundaries within SEA 23 were designated as the River Corridor SMA in the adopted Specific Plan, the County's underlying SEA 23 designation also remains in effect. Given that SEA CUP No. 94-087-(5) adjusted SEA boundaries, including SEA 23, this report analyzes project impacts on sensitive biological resources in and adjacent to the previously approved and revised SEA 23 boundary (see **Figure 9**, as shown later in this report) depicting the project location in relation to the revised SEA 23 boundary). This report analyzes impacts to biological resources on the project site.

1.3 NEWHALL RANCH SPECIFIC PLAN

The adopted Newhall Ranch Specific Plan will guide the long-term development of the 11,963-acre Newhall Ranch community, comprising a broad range of residential, mixed-use and non-residential land uses developed within five village areas. The Specific Plan contains the approved land use plan, development regulations, design guidelines and implementation program that are designed to create a mixed-use community consistent with the goals, policies and objectives of the Los Angeles County General Plan and Santa Clarita Valley Areawide Plan. The Specific Plan is regulatory in nature and serves as the zoning for Newhall Ranch. Subsequent development plans and tentative subdivision maps must be consistent with the adopted General Plan, Areawide Plan and Specific Plan.

Furthermore, the Specific Plan establishes the regulations and standards for the protection of open areas adjacent to development and the two large river corridor and High Country SMAs, totaling approximately 6,170 acres. In addition, an off-site condition requires the applicant to dedicate to the public 1,517 acres of land in the Salt Creek watershed in Ventura County, adjacent to the Specific Plan site. These regulations and standards are part of the Newhall Ranch Resource Management Plan (RMP), contained in Section 2.6 of the adopted Specific Plan and provided to SEATAC under separate cover along with this report.

As approved by the Board of Supervisors, the Specific Plan allows for up to 21,308 dwelling units (including 423 second units); 629 acres of mixed-use development; 67 acres of commercial uses; 249 acres

of business park land uses; 37 acres of visitor-serving uses; 1,014 acres of open space, including 181 acres of community parks and 833 acres in other open spaces; 5,157 acres in special management areas, 55 acres in 10 neighborhood parks; a 15-acre lake; a public trail system; an 18-hole golf course; two fire stations; a public library; an electrical station; reservation of five elementary school sites, one junior high school site and one high school site; a 6.8 million gallon per day (mgd) WRP; and other associated community facilities. Build-out of the Specific Plan is projected to occur over approximately 25 to 30 years, depending upon economic and market conditions.

The Specific Plan's adopted Land Use Plan and the Overall Land Use Plan Statistical Table provide the framework for development of the Specific Plan area. The adopted Land Use Plan describes the Newhall Ranch Specific Plan land use designations. The designations include five types of Residential uses (estates, low density, low-medium density, medium density and high density); Mixed Use; Commercial; Business Park; Visitor-Serving; open area uses; two SMAs/SEAs; and a Spineflower Conservation Overlay Easement area, all linked by a comprehensive system of roadways, trails and utility easements. Land use overlays are also included on the approved Land Use Plan to show approximate locations of public facility and recreation uses, such as parks, schools, library, golf course, fire stations and the WRP. The Specific Plan contains an approved Village Plan, which identifies the five distinct villages within the Newhall Ranch Specific Plan. The five villages are

(1) **Riverwood** – situated north of the Santa Clara River and along SR-126;

(2) **Oak Valley** – located in the westerly portion of Potrero Canyon;

(3) **Potrero Valley** – occupying the central and easterly portions of Potrero Canyon;

(4) **Long Canyon** – situated in the valley and hills adjacent to the Sawtooth Ridge, south of the Santa Clara River; and

(5) **The Mesas** – overlooking the Santa Clara River in the northeast portion of the Specific Plan site.

The Newhall Ranch Specific Plan land use designations for the Landmark Village tract map site include Low-Medium Residential, Medium Residential, Mixed Use, Commercial and River Corridor SMA/SEA 23. The River Corridor SMA/SEA 23 forms the southern boundary of the Landmark Village tract map site. The land use overlays delineated on the Newhall Ranch Land Use Plan, which are pertinent to the Landmark Village tract map site, consist of "Community Park" and "Elementary School." The Landmark Village project represents the first phase in implementing the Newhall Ranch Specific Plan.

1.4 APPROVED RESOURCE MANAGEMENT PLAN AND MITIGATION MEASURES

The Landmark Village project would be subject to the mitigation measures contained in the RMP of the Specific Plan, the Newhall Ranch Program EIR (March 1999) and the Revised Additional Analysis (May 2003). These mitigation measures were approved by the Board of Supervisors in association with the Newhall Ranch Specific Plan and WRP project approvals on May 27, 2003. These measures are documented in the adopted revised Mitigation Monitoring Plans for both the Specific Plan and WRP and the approved RMP (see Specific Plan [May 27, 2003], Section 2.6, Resource Management Plan). **Appendix C** contains copies of the adopted Specific Plan and WRP Mitigation Monitoring Plans. At the County's request, the approved Specific Plan RMP (Section 2.6) is provided under separate cover to SEATAC.

1.4.1 Specific Plan Resource Management Plan

The Specific Plan RMP contains numerous mitigation measures designed to offset the loss of habitat due to implementation of the Specific Plan (see Specific Plan RMP, Section 2.6, pp. 2-85–2-135). For example, the RMP contains a mitigation and habitat management program for the (1) River Corridor SMA/SEA 23 (Section 2.6, pp. 2-92–2-107); (2) High Country SMA/SEA 20 (Section 2.6, pp. 2-108–2-116); and (3) Open Area (Section 2.6, pp. 2-117–2-118). The RMP permits the use of mitigation banking within the Specific Plan area (Section 2.6, p. 2-119). It also establishes a San Fernando Valley spineflower special study mitigation overlay and preserve program (Section 2.6, pp. 2-120–2-123), an oak resources replacement program (Section 2.6, pp. 2-124–2-126), a wildfire fuel modification plan (Section 2.6, pp. 2-127–2-130), and the hillside preservation and grading plan (Section 2.6, pp. 2-134–2-135).

The RMP also requires that a conservation easement be established over the River Corridor SMA/SEA 23 after development of areas adjoining the river are complete and includes the removal of cattle grazing. Furthermore, the RMP requires that a plan be prepared by the applicant and approved by the County for the permanent ownership and management of the adopted River Corridor SMA/SEA 23 as a "Significant Ecological Area."

The RMP further requires that a conservation agreement be established over the High Country SMA/SEA 20 and that a detailed program be developed for its long-term management and ownership. All of the existing High Country SMA/SEA 20 will be retained in a natural state. Vegetative cover within the adopted High Country SMA/SEA 20 will be enhanced by the eventual removal of cattle grazing, with the exception of grazing for management purposes, as provided in the Newhall Ranch RMP. The High Country SMA/SEA 20 is identified as a primary location for oak resource planting and enhancement to mitigate impacts that will occur within the development areas of the Specific Plan.

A critical component of the open area system to be established by the RMP is the connection between the High Country SMA/SEA 20 and the River Corridor SMA/SEA 23 along Salt Creek. As a condition of approval, the County has required the applicant to dedicate to the public in fee and/or by conservation easement the approximately 1,517 acres of land encompassing the Salt Creek watershed in Ventura County, adjacent to the Newhall Ranch Specific Plan. This additional land dedication will be managed in conjunction with the High Country SMA/SEA 20. The Salt Creek Corridor will provide a permanent regional linkage between the Santa Clara River (SEA 23) and the High Country SMA Santa Susana Mountains (SEA 20). Salt Creek is the most appropriate location for such a wildlife corridor connection because of several distinguishing characteristics. These include provision of a direct link between the two major open areas; less disturbance (i.e., grazing, agriculture, off-road impacts, etc.) than any of the other potential connections; it is bound through most of its length by open area on the north side and, therefore, will not be surrounded by development in the future; it includes both upland and riparian vegetation through most of the corridor; and it is topographically isolated from areas of development on Newhall Ranch.

1.4.2 Newhall Ranch Program EIR Mitigation Measures

The Newhall Ranch Program EIR incorporates mitigation from the Specific Plan RMP and requires additional mitigation to address impacts to special-status plant and wildlife species, including San Fernando Valley spineflower, unarmored threespine stickleback, arroyo toad, southwestern pond turtle, southwestern willow flycatcher, least Bell's vireo and other special-status species (of the species listed here, all but the arroyo toad have been found on the Specific Plan site). Measures are also included that address impacts to sensitive plant communities (e.g., riparian habitat) and other resources under the jurisdiction of the Army Corps of Engineers (ACOE) and California Department of Fish and Game (CDFG).[2]

1.5 LANDMARK VILLAGE PROJECT SUMMARY

The project applicant proposes to develop the 292.6-acre Landmark Village tract map site, along with 679.2-acres of land within and adjacent to the boundaries of the approved Specific Plan for several off-site, project-related components.[3] The Landmark Village project is located within the first phase of the Riverwood Village area of the approved Newhall Ranch Specific Plan. The land uses proposed as part of the project are consistent with the Newhall Ranch Specific Plan. The proposed project consists of residential, mixed-use and commercial development, along with roads, an elementary school site, a

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2 For a complete description of all of the adopted biota-related mitigation measures, please refer to the Specific Plan Revised Mitigation Monitoring Plan, Mitigation Measures 4.6-1–4.6-80, found in **Appendix C** to this report.

3 Portions of the proposed utility corridor and the proposed potable water tank site (located within the Valencia Commerce Center business park) are outside the boundaries of the Newhall Ranch Specific Plan.

community park, recreational centers, open space, trails and off-site grading/improvements, including the Long Canyon Road Bridge, bank stabilization, drainage improvements, potable and reclaimed water tanks, utility corridor, borrow site and related haul routes. Other facilities and infrastructure necessary to support the proposed project include a transportation, transit and circulation system, drainage and flood protection system, domestic water system and sanitary sewer system.

The project applicant is requesting approval of the following discretionary entitlements to allow implementation of the proposed Landmark Village project: (a) General Plan, Sub-Plan and Specific Plan Amendment Nos. 00-196-(5); (b) Vesting Tentative Tract Map No. 53108; (c) SEA CUP No. 00-196-(5) for project-level development within the Specific Plan's River Corridor SMA/SEA 23 boundary; (d) Oak Tree Permit 00-196-(5); (e) Off-Site Soil Transport Approval; and (f) CUP for off-site grading in excess of 100,000 cubic yards (collectively, "Project Approvals").

If the requested Project Approvals are adopted by the County, the proposed Landmark Village project would allow for construction of 1,444 residential dwelling units (308 single-family units, 1,080 multi-family units), 1,033,000 square feet of commercial/mixed uses, a 9-acre elementary school, a 16.1-acre community park, public and private recreational facilities, trails and roads improvements including the Long Canyon Bridge (**Table 1, Landmark Village Statistical Summary**).

Table 1
Landmark Village Statistical Summary

Land Use	Acres	Amount (units/square feet)	Density (du/acre or FAR)
Residential*			
Single Family	49.9	308	6.2
Multi-Family	60.7	685	11.3
Apartments	21.0	451	21.5
Subtotal	131.6	1,444	11.04
Commercial/Mixed Use	36.5	1,033,000	0.65
Elementary School	9.0	NA	NA
Open Space			
Parks	16.1	NA	NA
Recreation Centers	5.2		
Trails & Misc. (slopes, water quality basins)	38.3		
Subtotal	59.6		
Roads	55.8	NA	NA
TOTAL	292.6	1,444 du 1,033,000 sf	0.65

Source: Vesting Tentative Tract Map No. 53108.
** Includes units within mixed-use areas.*
du = dwelling unit; sf = square feet.
FAR=floor area ratio.

Additional actions, such as grading permits, building plan review and building permits, would be required by the County prior to actual grading and construction on the project site.

1.6 DOCUMENTS/STUDIES USED OR REFERENCED IN THIS REPORT

Numerous studies have been conducted to describe the existing conditions on the Landmark Village project site and to analyze anticipated project-related impacts on water quality, the hydrology and hydraulics of the Santa Clara River and special-status plant and wildlife species. A complete list of biological surveys conducted on the Landmark Village project site and the technical reports incorporated into this Biota Report is included in **Section 5.0, Methods, Table 5**. The resumes of the consultants involved in the field surveys and the preparation of incorporated technical reports are included in **Appendix H.**

2.0 PROJECT DESCRIPTION

2.1 LOCATION

The Landmark Village project site is located within the approved Newhall Ranch Specific Plan area, in northwestern Los Angeles County, approximately 30 miles northwest of downtown Los Angeles (**Figure 1, Project Site Location**). The project site is in an unincorporated portion of Los Angeles County in the Santa Clarita Valley Planning Area. The City of Santa Clarita is located east of the site, just beyond Interstate 5 (I-5). The banks of the Santa Clara River form the southern boundary, and SR-126 defines the northern boundary, of the tract map site. The eastern boundary of the tract map site abuts Castaic Creek and the western boundary abuts Chiquito Canyon Creek.

Land uses surrounding the Landmark Village tract map site include (a) to the north, relatively sparse rural residential uses (the community of Val Verde and San Martinez Grande), the Chiquito Canyon Landfill, high-intensity business park uses (Valencia Commerce Center); (b) to the east, an existing WRP (Valencia WRP No. 32), a California Highway Patrol station, high-intensity commercial/recreational uses (Magic Mountain Theme Park), hotels, restaurants and service stations adjacent to I-5; and (c) to the south and west, currently undeveloped grazing or agricultural land associated with the Newhall Ranch Specific Plan site (**Figure 2**, **Project Vicinity Map**).

2.2 PROJECT CHARACTERISTICS

Consistent with the Newhall Ranch Specific Plan, the applicant proposes to develop the Landmark Village tract map site with a total of 1,444 residential dwelling units (308 single-family units and 1,136 multi-family units), approximately 1,033,000 square feet of commercial/mixed-use space, a 9-acre elementary school and supporting roadway and infrastructure improvements. A total of 59.6 acres of public and private recreational facilities, trails, and open space, including a 16.1-acre community park, are also planned as part of the proposed project.

A hiking/biking trail is proposed as part of the tract map site, along the bank of the Santa Clara River beginning at the northeastern project boundary along Castaic Creek and extending west along the Santa Clara River. The conceptual alignment follows the top of the bank stabilization (approximately 50–150 feet from the existing riparian edge), which runs along the southern boundary of the tract map site. The trail is approximately 16 feet wide and approximately 2 miles in length, and it will be constructed of asphalt or similar material. Themed fencing will define the perimeter of the trail and the alignment will be landscaped with native plant materials and the trail will not be lighted at night. The trail will implement a portion of the "Regional River Trail" contemplated by the approved Specific Plan.

Table 1, Landmark Village Development Statistical Summary, above, provides a specific breakdown of the project land uses.

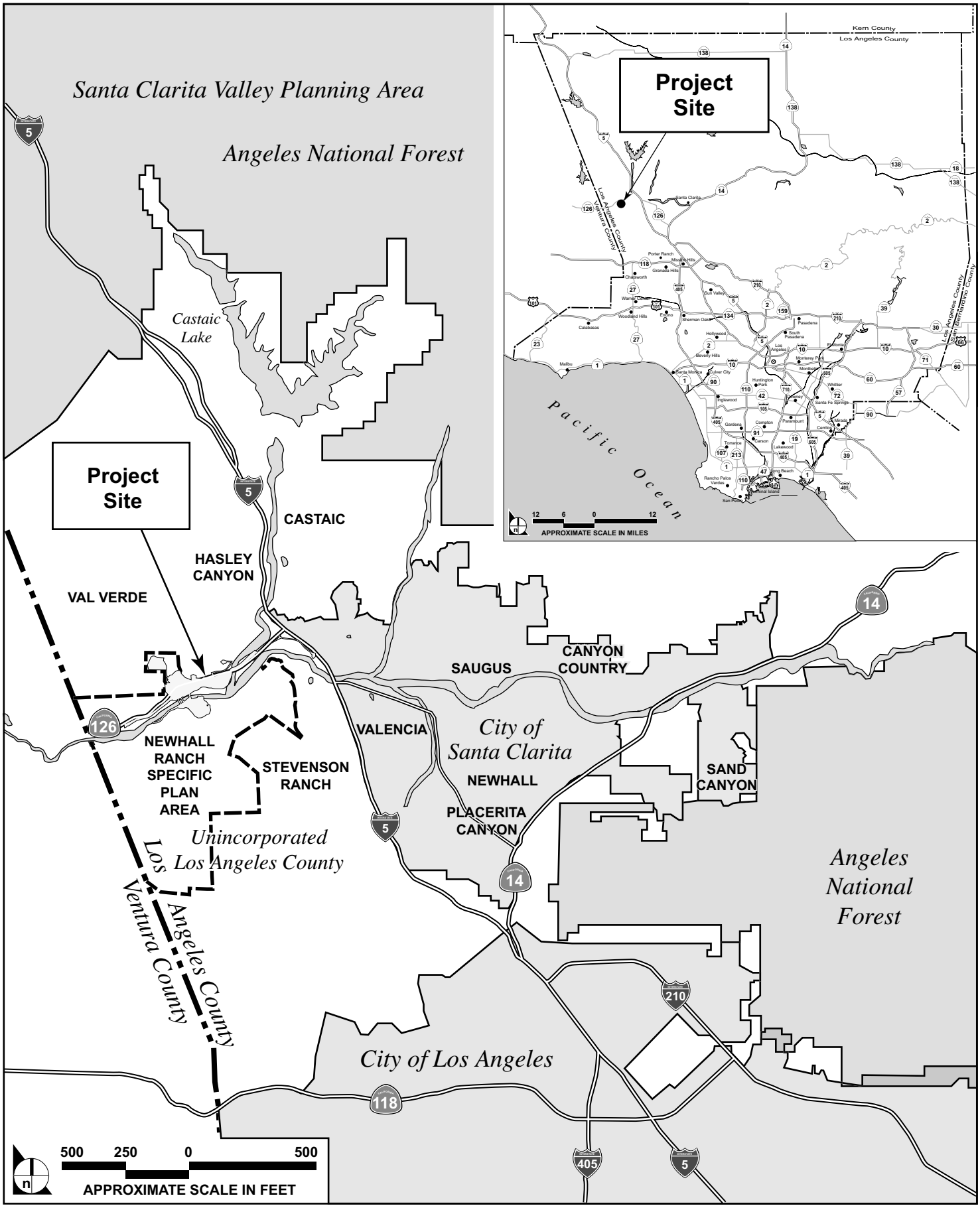
2.3 ASSOCIATED OFF-SITE PROJECT COMPONENTS

In addition to the 292.6-acre tract map site, the project also includes 679.2 acres of grading and/or development at locations beyond the tract map site. The locations of these project components relative to the tract map site are shown in **Figure 3, Tract Map Site and Associated Off-Site Projects.**

The proposed project includes construction of the Long Canyon Road Bridge. The bridge is intended as the primary bridge crossing over the Santa Clara River providing access to the central portions of the Newhall Ranch Specific Plan. The bridge will span approximately 1,000 feet over the Santa Clara River, with a width of approximately 100 feet. Support for the bridge will involve construction of 11 piers within the river corridor. Each pier will be spaced approximately 100 feet apart. Additionally, abutments and bank stabilization would be required on both sides of the bridge to protect against erosive forces.

To elevate the tract map site above the floodplain of the Santa Clara River, soil would be imported from a borrow site located within Long/Adobe Canyon south of the river. This borrow site is approximately 215 acres in size and is located due south of the tract map site. Haul routes would be created to cross the river between Long Canyon and the tract map site (river crossings would be similar in construction to those installed annually to support agricultural operations on the Specific Plan site; steel piping is placed in the river and then covered with earth material). To accommodate project-necessitated improvements to SR-126 and debris basins for storm water flows that are collected by the project storm drainage system, land directly north of SR-126 within Chiquito Canyon would be graded. The Chiquito Canyon grading site is approximately 120 acres in size. The project also includes a 110-acre utility corridor that runs parallel to SR-126, from the western boundary of the tract map site to the Newhall Ranch WRP site near the Ventura County line, and from the eastern boundary of the tract map site to I-5, then south to the existing Los Angeles County Sanitation District 32 WRP. The utility corridor would serve to extend municipal services (e.g., wastewater lines, water lines, etc.) to the tract map site and would be largely placed within the existing utility easements within SR-126.

The proposed project would include buried bank stabilization along the Santa Clara River and Castaic Creek adjacent to and downstream of the tract map site. In total, approximately 17,700 linear feet (LF) of bank would be provided with buried bank stabilization. This would include approximately 10,900 feet fronting the southern and eastern boundary of the tract map site on the north bank of the river and the west bank of Castaic Creek, and approximately 6,800 LF on the south bank of the river off the tract map site, beginning at the Long Canyon Road Bridge and extending westward. Buried bank stabilization provides riverbank protection material in terms of both surface erosion and structural stability. Areas disturbed during installation of the buried bank stabilization would be revegetated following the conclusion of construction-related activities.

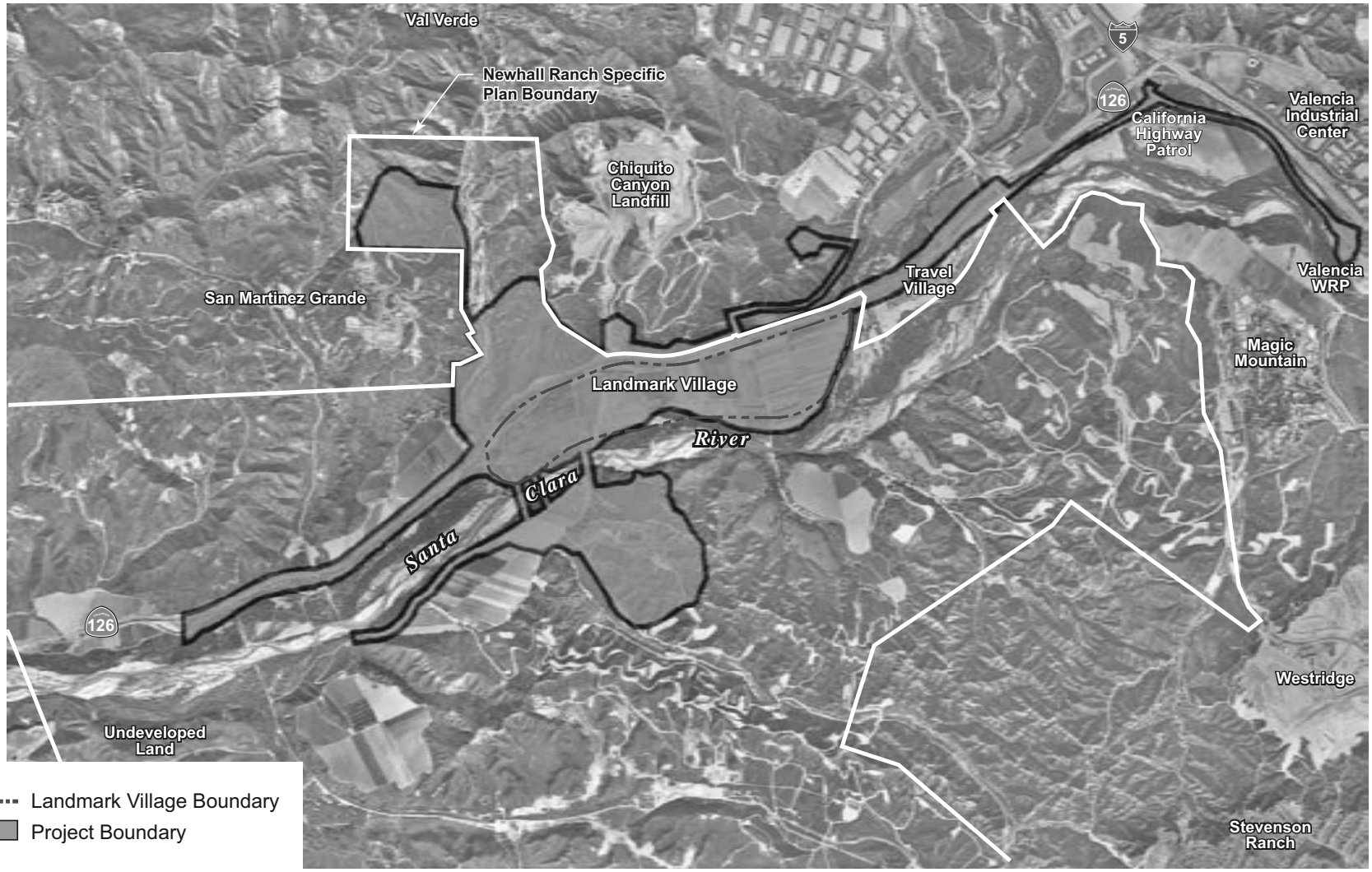


SOURCE: Impact Sciences, Inc. – April 2005

FIGURE **1**

Project Site Location

32-92•07/05

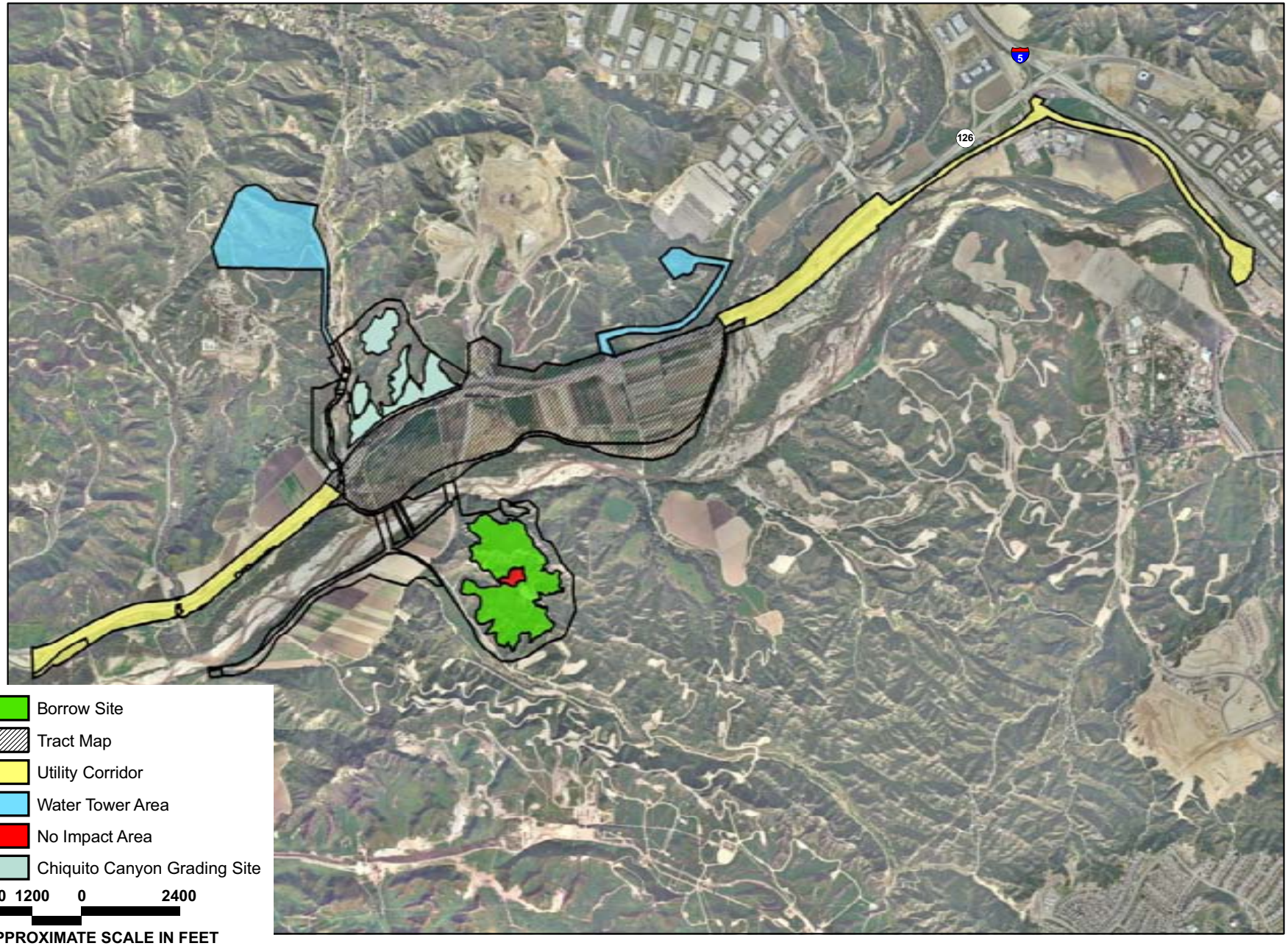


SOURCE: Impact Sciences, Inc. – October 2004

FIGURE 2

Project Vicinity Map

32-92•05/05



SOURCE: Impact Sciences, Inc. – June 2005

FIGURE **3**

Tract Map Site and Associated Off-Site Projects

32-92•06/05

Potable water would be conveyed to the tract map site from two separate water tank sites. One tank is proposed north of SR-126 within the existing Valencia Commerce Center business park immediately adjacent to an existing water tank. Impacts to biological resources associated with development of this water tank site were previously analyzed as part of the Valencia Commerce Center EIR. The second potable water tank would be located within the borrow site, in an area to be graded as part of the proposed soil transfer. The project would also implement a portion of the Specific Plan's reclaimed water storage and distribution system by installing two reclaimed water tanks in Chiquito Canyon, north of the Chiquito Canyon grading site.

2.4 GRADING

The previously approved Newhall Ranch Specific Plan included the Conceptual Grading Plan (Program EIR, Figure 1.0-14), which identified the areas where proposed grading activities would occur within the Specific Plan. The adopted Specific Plan also incorporated the Hillside Design Guidelines established by the County Department of Regional Planning (December 1987). In addition, Chapter 4 of the Specific Plan contains grading guidelines designed to achieve the Specific Plan goals and objectives relevant to grading.

The Landmark Village Conceptual Grading Plan identifies areas where proposed grading will occur on the tract map site (**Figure 4, Conceptual Grading Plan**). Grading and associated earthwork would require the movement of approximately 4.2 million cubic yards of earth on the 292.6-acre tract map site during removal and re-compaction activity. Project grading requires the import of 5.8 million cubic yards from the Long/Adobe Canyon borrow site in order to meet flood control requirements on the tract map site. The depth of fill on the tract map site would be an average of 10 feet above the existing riverbank. Project grading also requires the balanced movement of approximately 1.2 million cubic yards at the Chiquito Canyon grading site. **Figure 3** depicts the borrow site, the haul routes, including the locations of the proposed river crossings, and the Chiquito Canyon grading site. The project's proposed Conceptual Grading Plan is consistent with the grading activities contemplated by the approved Specific Plan.

The off-site borrow site grading plan will excavate and reshape the hills and depressions forming the ridge separating Long and Adobe Canyons. Much of this work occurs along the top and bluffs of an unnamed plateau located just east of Sawtooth Ridge. This plateau ranges in elevation from a low of 1,130 feet at its northernmost point to a high of 1,220 in the southeast, and is characterized by an increasingly steeper grade. The proposed grading plan would excavate the southeastern portion of this plateau, creating a gentler slope leading up to the top of the ridge. The resultant manufactured slope angle would range from 5:1 to 2:1 (horizontal/vertical). The grading plan also alters the western facing slope leading up to the plateau, creating a bench separated by two manufactured slopes stepping down the west-facing ridgeline defining Adobe Canyon at a 3:1 grade.

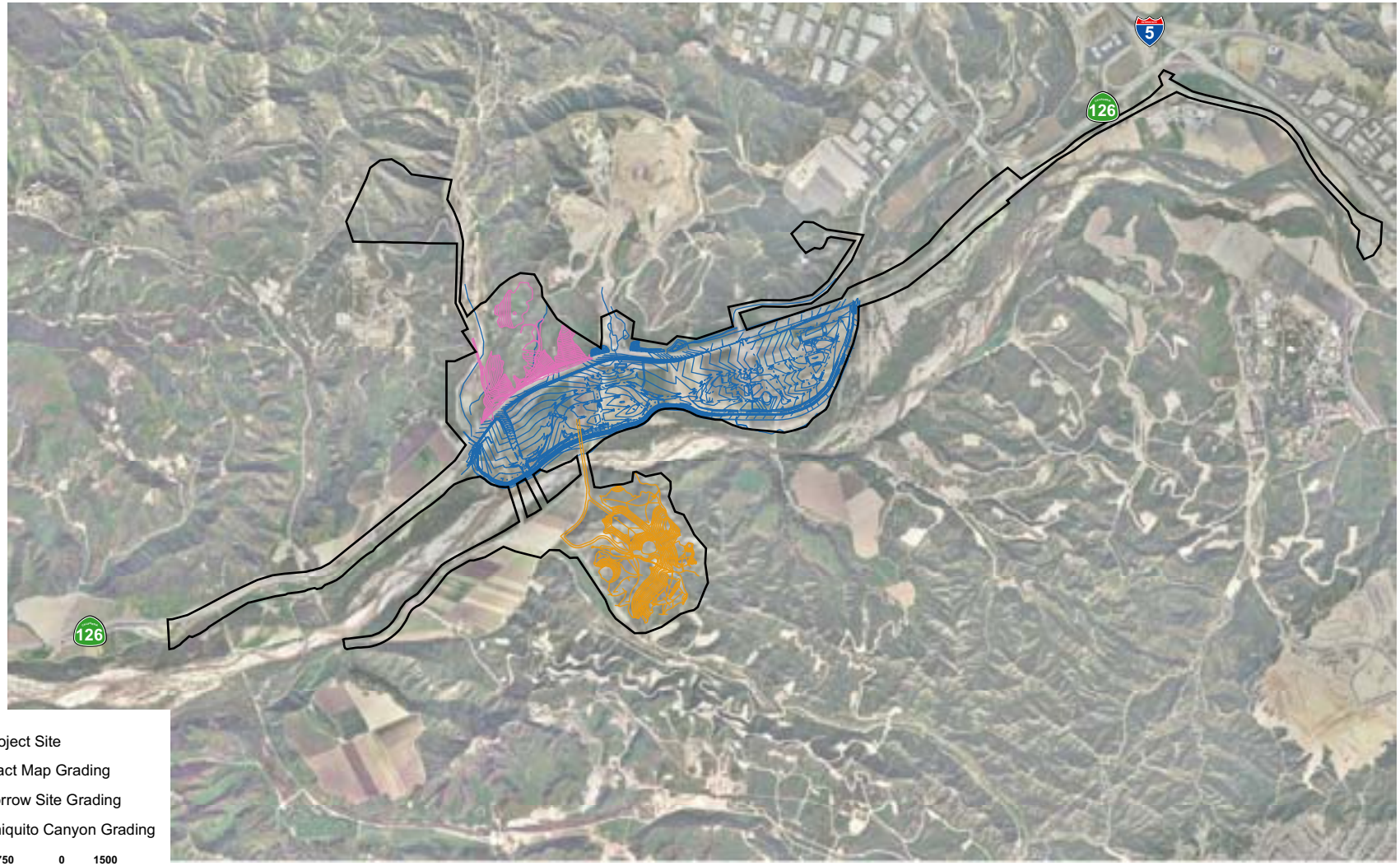
Additional earthwork is planned at the terminus of Adobe Canyon where a series of excavations will result in a manufactured slope approximately 100 feet in height at a relatively uniform 3:1 grade. A series of benches, swales and debris basins will also be constructed to collect, convey and release runoff in a controlled manner. A maximum of 5.8 million cubic yards of earth may be excavated from the Long Canyon/Adobe Canyon area and transported across the river to the tract map site generally using existing at-grade agricultural crossings that would be widened to accommodate earthmoving equipment. All of this area is within the approved development footprint of the Specific Plan.

The second off-site grading location (i.e., Chiquito Canyon grading site) is planned just north of SR-126 and east of its intersection with Chiquito Canyon Road. This grading site is proposed on the ridgeline of a northeast-southwest trending hillside. The terrain on the southwesterly portion of this hill gently slopes toward the intersection in a "finger" shape where elevations reach approximately 950 feet above mean sea level (msl) at its low point (slightly elevated above the roadbed). The terrain becomes progressively steeper and more rugged towards the northeast portion of the ridge, with the peak elevation reaching 1,160 feet above msl. The Conceptual Grading Plan would lower the "finger" of land extending towards the intersection of Chiquito Canyon Road with SR-126 by approximately 60 feet when compared to the existing elevation. Rather than a gradual incline that extends upward at an increasingly greater grade, the reshaped slope would approximate the grade of SR-126 for about 1,500 feet east of the intersection with Chiquito Canyon Road. At this point, the grading plan creates a manufactured slope that extends upward at a uniform 3:1 grade reaching a high of 1,160 feet above msl. A series of benches, swales and debris basins will also be constructed to collect, convey and release runoff in a controlled manner. Approximately 1.2 million cubic yards of earth will be excavated from this area and placed as fill in the adjacent canyons to facilitate creation of debris basins. All of this graded area is within the grading footprint of the Specific Plan.

Upon completion of the grading operations associated with the above activities, additional work is needed on the tract map site for grading of development areas and development pads. Grading would consist of rough grading operations for major roads and infrastructure, drainage patterns, and building pads for the various land uses within the tract map site. Graded slopes will be landscaped and irrigated pursuant to the County grading and erosion control requirements.

2.5 BANK STABILIZATION

The certified environmental documentation for the Newhall Ranch Specific Plan identified and analyzed the floodplain modifications resulting from implementation of the Specific Plan, including installation of bank stabilization where necessary, to protect against erosion at specified locations within the Specific Plan site (see Revised Additional Analysis, Figures 2.3-4, 2.3-5). The Conceptual Backbone Drainage Plan of the Newhall Ranch Specific Plan provided drainage and flood control protection to developed areas, while preserving the main river corridor as a natural resource.



SOURCE: PSOMAS – July 2005, Impact Sciences, Inc. – July 2005

FIGURE **4**

Conceptual Grading Plan

32-92•07/05

The approved Drainage Plan also identified the following criteria to be followed by projects implementing the Specific Plan (also see Specific Plan [May 2003], Chapter 2, pp. 2-71-2-75):

- the flood corridor must allow for the passage of Los Angeles County Capital Flood flow without the permanent removal of natural river vegetation (except at bridge crossings);
- the banks of the river will generally be established outside of the "waters of the U.S.," as defined by federal laws and regulations and as determined by the delineation completed by the ACOE in August 1993;
- where the ACOE delineation width is insufficient to contain the Capital Flood flow, the flood corridor will be widened by an amount sufficient to carry the Capital Flood flow without the necessity of permanently removing vegetation or significantly increasing velocity;
- where development is proposed within the existing Los Angeles County floodplain, the land where development is to occur will be elevated in accordance with Los Angeles County policies to remove it from the floodplain; and
- bank stabilization will occur only where necessary to protect against erosion.

The Landmark Village project proposes bank stabilization on the west side of the Santa Clara River as well as the west side of the Castaic Creek, consistent with the approved Specific Plan and associated environmental documentation. **Figure 5, Proposed Bank Stabilization**, shows the proposed locations of bank stabilization on the project site. The proposed project incorporates techniques to meet the requirements of flood control, while maintaining the natural resources within the river.

Buried bank stabilization provides riverbank protection material in terms of both surface erosion and structural stability. The Landmark Village project proposes buried bank stabilization where necessary to protect against erosion, consistent with the Federal Emergency Management Administration (FEMA) and Los Angeles County Department of Public Works' requirements. The proposed project would include buried bank stabilization along the Santa Clara River and Castaic Creek adjacent to and downstream of the tract map site. In total, approximately 17,700 LF of bank would be provided with buried bank stabilization. This would include approximately 10,900 feet fronting the southern and eastern boundary of the tract map site on the north bank of the river and the west bank of Castaic Creek, and approximately 6,800 LF on the south bank of the river, beginning at the Long Canyon Road Bridge and extending westward.

The buried bank stabilization along portions of the north and south bank of the river corridor would be designed and constructed to retain the river's significant riparian vegetation and habitat, to allow the river to continue to function as a regional wildlife corridor and to provide flood protection pursuant to County standards. Riparian and upland areas disturbed during installation of the buried bank stabilization would be revegetated following the conclusion of construction-related activities. All of the bank stabilization proposed in conjunction with the project is consistent with the Newhall Ranch Specific Plan.

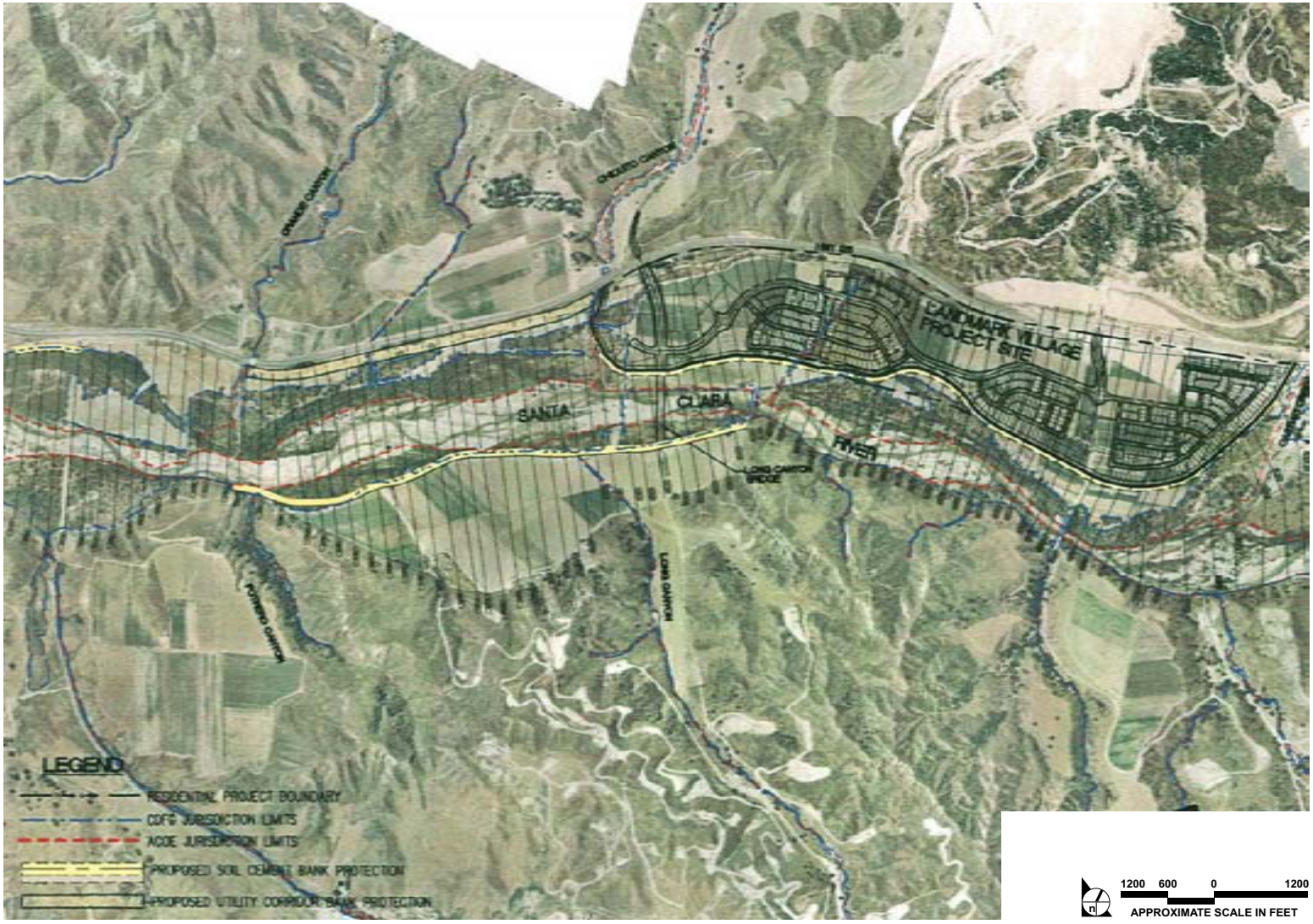
Figure 6, **Bank Stabilization – Typical Cross Section**, depicts three typical cross-sections for buried bank stabilization. As shown, the buried bank stabilization approach uses soil cement, which is buried beneath the existing banks of the river to resist scouring. The soil placed on top of the bank stabilization is replanted with native vegetation to return the disturbed area to its existing condition upon completion of construction. Typically, the lining must be buried at least twice the height of the lining in order to resist scouring. Burying the toe of the lining requires temporary excavation and backfilling. A temporary construction zone of approximately 75 feet would occur at the base of the bank protection in order to bury the material. The original channel elevation would be restored after construction. The area would also be replanted with native vegetation.

Figure 7, **Bank Stabilization Techniques**, provides illustrations of existing exposed and buried bank stabilization techniques to be used in this project. This figure also depicts the relationship between the river, buried bank stabilization and trail areas. The representative photographs used in this figure are taken from previously constructed projects located in the Valencia community, in which exposed and buried bank stabilization were used.

2.6 REQUESTED DISCRETIONARY ACTIONS AND APPROVALS

The project applicant is proposing an amendment to the Master Circulation Plan of the Newhall Ranch Specific Plan and the County Master Plan of Highways for the Specific Plan area. Specifically, the applicant is requesting that "A" Street as identified on Vesting Tentative Tract Map No. 53108 be downgraded from a Secondary Highway to a Collector Street. In addition to the proposed modification to the County Master Plan of Highways identified above, the applicant is seeking the following approvals/permits:

- Vesting Tentative Tract Map No. 53108;
- SEA CUP No. 00-196-(5) for project-level development within the Specific Plan's River Corridor SMA/SEA 23 boundary;
- CUP for off-site grading in excess of 100,000 cubic yards;
- Grading Permit;
- Oak Tree Permit;
- Off-Site Materials Transport Approval;
- U.S. Clean Water Act (CWA) Section 404 Permit;
- Regional Water Quality Control Board, CWA Section 401 Water Quality Certification;
- California Fish and Game Code Section 1601/1603 Streambed Alteration Agreement; and
- South Coast Air Quality Management District Permits for Air Emissions.

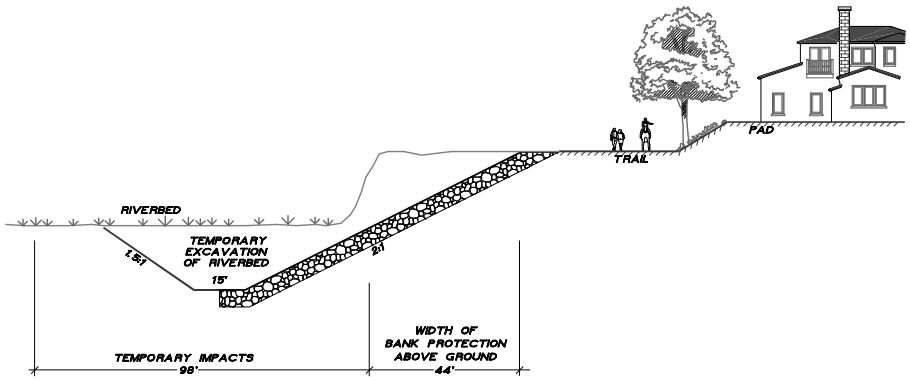


SOURCE: PACE Engineering – June 2005

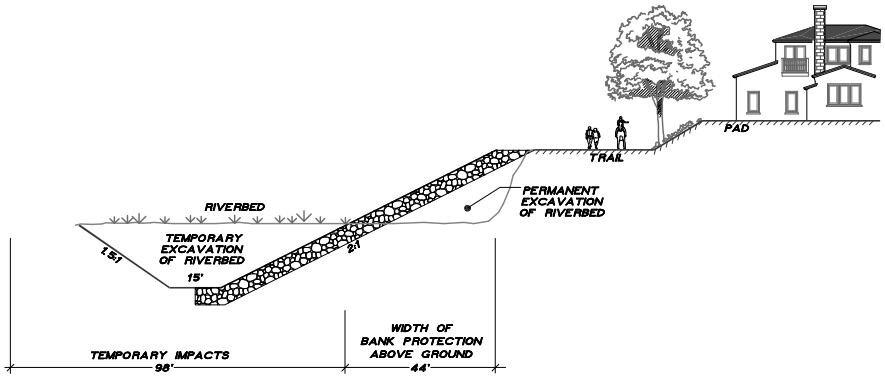
FIGURE **5**

Proposed Bank Stabilization

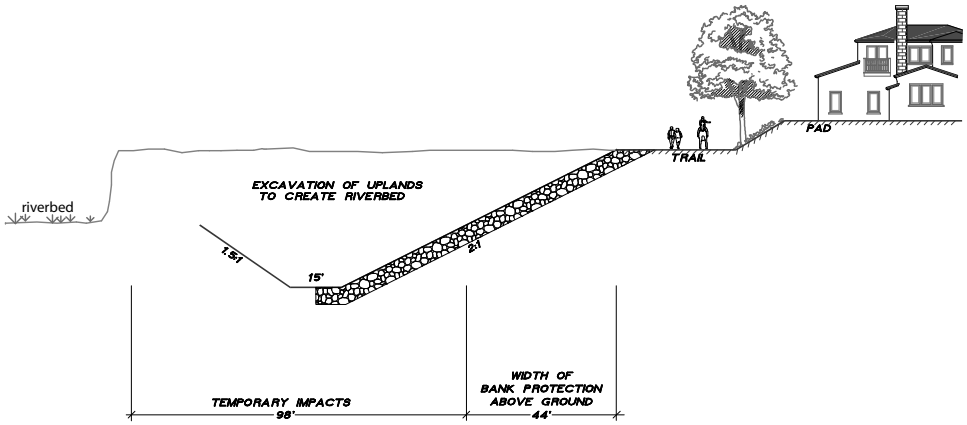
32-92•06/05



Section A
No Permanent Loss of Riverbed, Only Temporary Impacts



Section B
Permanent Loss of Riverbed and Temporary Impacts



Section C
No Permanent Loss of Riverbed and No Temporary Impacts

35.0 17.5 0 35
APPROXIMATE SCALE IN FEET

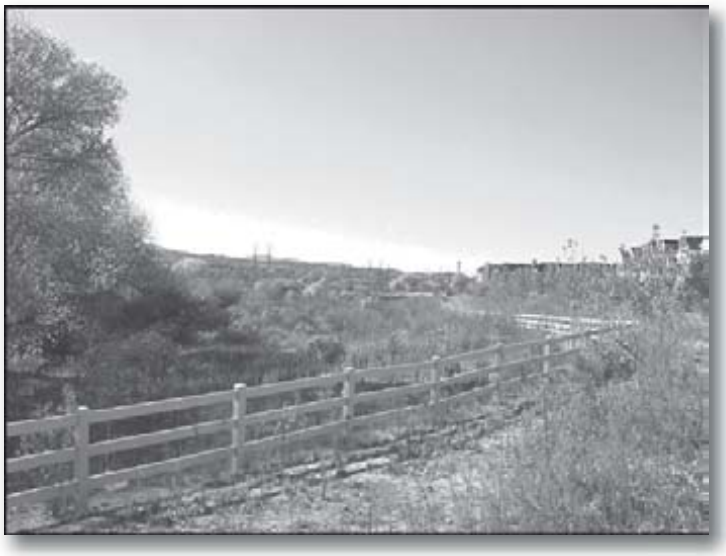
SOURCE: FORMA – March 2002

FIGURE **6**

Bank Stabilization, Typical Cross Section

32-92•05/05

Stabilization at San Francisquito Creek
at the West Bank
(This photo depicts exposed bridge abutment)



Stabilization at Bridgeport
(This photo depicts
Buried Bank stabilization)

Stabilization at East Bank from
Decoro Bridge
(This photo depicts River/Buried Bank
Stabilization, Upland Preserve and a Trail)

SOURCE: PSOMAS – 2003

FIGURE **7**

3.0 SUMMARY OF SIGNIFICANT IMPACTS

3.1 SUMMARY OF THE NEWHALL RANCH PROGRAM EIR AND ADDITIONAL ANALYSIS FINDINGS

The Newhall Ranch Specific Plan would develop approximately 5,793 acres of the 11,963-acre Specific Plan site (or 49 percent of the site), and would preserve as undeveloped land a total of approximately 6,170 acres (or 51 percent of the site). In addition, an off-site condition requires the applicant to dedicate to the public 1,517 acres of land in the remaining Salt Creek watershed in Ventura County, adjacent to the Specific Plan site. This land is also required to be managed in conjunction with and in the same manner as the High Country SMA/SEA 20. Portions of proposed development within the Specific Plan area would occur in sensitive upland and riparian habitats. Therefore, the Specific Plan was determined to have significant impacts on the biological resources located on the site. Implementation of measures contained in the Specific Plan RMP and the mitigation measures contained in the Newhall Ranch certified environmental documentation would reduce some, but not all, Specific Plan impacts to special-status plant and wildlife species, riparian, wetland and aquatic resources (located along the river corridor) to below California Environmental Quality Act (CEQA) thresholds of significance. While mitigation is also provided to reduce the magnitude of impacts to upland resources, certain of these impacts were also expected to remain significant. Also, despite the preservation of the major wildlife corridor along the Santa Clara River, the Specific Plan would significantly impact the ability of some animals to move across portions of the Specific Plan area. **Table 2, Significant Biological Impacts – Newhall Ranch Specific Plan and WRP**, summarizes the Specific Plan's impacts on biological resources, the applicable mitigation measures and the significance findings after the mitigation is implemented.

Table 2
Significant Biological Impacts – Newhall Ranch Specific Plan and WRP

Impact Description	Mitigation Measures	Final Conclusion After Mitigation
General Wildlife Impacts – Based on the amount of habitat lost (5,132 acres), the impact potential of implementation of the Newhall Ranch Specific Plan on the diminishment of habitat for wildlife or plants is considered significant.	See measures listed below for impacts to sensitive animal species.	Significant
The impact potential of implementation of the Newhall Ranch Specific Plan on the movement of resident wildlife species is considered significant due to the reduction in open land available for wildlife movement between the river and upland areas.	See measures listed below for impacts to sensitive animal species and habitats.	Significant

Impact Description	Mitigation Measures	Final Conclusion After Mitigation
Loss of Habitat – The loss of habitat on the site is substantial. As proposed, implementation of the Specific Plan would result in the loss of 1,820 of the 5,183 acres of coastal sage scrub, 202 of the 1,213 acres of chaparral, and 1,480 of the 1,896 acres of non-native grassland habitat present on the site (when combined, 42 percent of these vegetation types would be lost). Given the concern for this species (coast horned lizard) in the region, the substantial loss of habitat, and potentially the direct loss of individuals of this species, this impact would be considered significant without mitigation.	See measures listed below for impacts to sensitive animal species and habitats.	Significant
It is acknowledged that any loss of plant species listed as Rare, Threatened or Endangered is considered a significant impact. Those include the following		
Slender-horned spineflower (significant if present)	Mitigation Measures 4.6-27, 4.6-34, 4.6-35, and 4.6-53	Not Significant
California Orcutt grass	Mitigation Measures 4.6-27, 4.6-34, 4.6-35, and 4.6-53	Not Significant
Lyon's pentachaeta	Mitigation Measures 4.6-27, 4.6-34, 4.6-35, and 4.6-53	Not Significant
Nevin's barberry	Mitigation Measures 4.6-27, 4.6-34, 4.6-35, and 4.6-53	Not Significant
Thread-leaved brodiaea	Mitigation Measures 4.6-27, 4.6-34, 4.6-35, and 4.6-53	Not Significant
Santa Susana tarplant	Mitigation Measures 4.6-27, 4.6-34, 4.6-35, and 4.6-53	Not Significant
Braunton's milk vetch	Mitigation Measures 4.6-27, 4.6-34, 4.6-35, and 4.6-53	Not Significant
San Fernando Valley spineflower (significant in Additional Analysis)	Mitigation Measures 4.6-53, 59, and 65–80	Not Significant
Short-joint beavertail cactus (significant in Additional Analysis)[a]	Mitigation Measures 4.6-27, 34, 35, 53, and 59	Not Significant
Calochortus (potentially significant in Additional Analysis depending upon actual species present)	Mitigation Measures 4.6-27, 34, 35, 53, and 59	Not Significant
Dudleya (potentially significant depending upon actual species present)[a]	Mitigation Measures 4.6-27, 34, 35, 53, and 59	Not Significant
Based on this analysis of indirect impacts to spineflower and other sensitive plants, seven indirect impacts/edge effects are considered significant in connection with the proposed development of Newhall Ranch.	Mitigation Measures 4.6-53, 4.6-59, and 4.6-65–80	Not Significant
Project Construction and operation may potentially significantly impact a number of sensitive animal species through loss of habitat and/or decrease in water quality if impacts are unmitigated. Species include the following:		
Unarmored threespine stickleback	Mitigation Measures 4.6-53, 4.6-54, 4.6-55, 4.6-57, 4.6-58, and 4.6-59	Not Significant
Least Bell's vireo	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-56, and 4.6-59	Not Significant

Impact Description	Mitigation Measures	Final Conclusion After Mitigation
Southwestern willow flycatcher	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-56, and 4.6-59	Not Significant
Arroyo chub	RMP Mitigation Measure 4.6-44, and EIR Mitigation Measures 4.6-53, 4.6-55, 4.6-57, and 4.6-58	Not Significant
Santa Ana sucker	RMP Mitigation Measure 4.6-44 and EIR Mitigation Measures 4.6-53, 4.6-55, 4.6-57, and 4.6-58	Not Significant
Southwestern pond turtle	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-56, and 4.6-55	Not Significant
Western spadefoot toad	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-56, and 4.6-55	Not Significant
California horned lizard	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measures 4.6-53, 4.6-56, and 4.6-55	Significant
San Diego horned lizard	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measures 4.6-53, 4.6-56, and 4.6-55	Significant
Northern harrier	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Cooper's hawk	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
Vermilion flycatcher	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
Yellow warbler	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
Summer tanager	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant

Impact Description	Mitigation Measures	Final Conclusion After Mitigation
Southern California rufous-crowned sparrow	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measures 4.6-53, 4.6-56, and 4.6-55	Significant
Tricolored blackbird	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-56, and 4.6-55	Significant
San Diego desert woodrat	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measures 4.6-53, 4.6-56, and 4.6-55	Significant
San Diego black-tailed jackrabbit	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measures 4.6-53, 4.6-56, and 4.6-55	Significant
Two-striped garter snake	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-56, and 4.6-55	Not Significant
Great blue heron	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
Great egret	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
Snowy egret	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55 and 4.6-56	Not Significant
Black-crowned night heron	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
White-tailed kite	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Mountain lion	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Arroyo southwestern toad	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant

Impact Description	Mitigation Measures	Final Conclusion After Mitigation
Swainson's hawk	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Mountain plover	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Western least bittern	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
Fulvous whistling duck	Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
Bell's sage sparrow	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Ferruginous hawk	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Silvery legless lizard	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Pale Townsend's big-eared bat	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
Greater western mastiff bat	RMP Mitigation Measures 4.6-1–4.6-26, and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
Coast patch-nosed snake	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Western burrowing owl	Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Sharp-shinned hawk	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Golden eagle	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant

Impact Description	Mitigation Measures	Final Conclusion After Mitigation
Pallid bat	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
Coastal rosy boa	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
San Bernardino ringneck snake	RMP Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-53	Significant
Yuma myotis	RMP Mitigation Measures 4.6-1–4.6-26 and EIR Mitigation Measures 4.6-53, 4.6-55, and 4.6-56	Not Significant
Development of the Specific Plan would result in impacts to sensitive habitats including the following:		
Coastal sage scrub	Mitigation Measures 4.6-27–4.6-43	Significant
Valley oak woodland/savanna	Mitigation Measures 4.6-27–4.6-43	Significant
Elderberry scrub	Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-60	Not Significant
Mainland cherry forest	Mitigation Measures 4.6-27–4.6-43 and EIR Mitigation Measure 4.6-61	Not Significant
Southern willow scrub	Mitigation Measures 4.6-1–4.6-26	Not Significant
Southern cottonwood-willow riparian forest and southern willow riparian woodland	Mitigation Measures 4.6-1–4.6-26	Not Significant
Valley freshwater marsh and ponds	Mitigation Measures 4.6-1–4.6-26	Not Significant
Wetlands	Mitigation Measures 4.6-1–4.6-26	Not Significant
SEA 20 – High Country	Mitigation Measures 4.6-1–26	Not Significant
SEA 23 – River Corridor	Mitigation Measures 4.6-26a–52	Not Significant
Indirect Impacts – implementation of the Newhall Ranch Specific Plan has the potential to indirectly impact adjacent natural areas and sensitive biological resources that occur proximal to the site. This would occur as a result of increased use of the Santa Clara River and upland areas by humans and domestic animals, increased use of adjacent natural areas by animals typical of an urban environment, and the potential effects of light, glare, and sediment and urban pollutant-laden runoff, unless mitigated.	Mitigation Measures 4.6-18 and 4.6-19 and EIR Mitigation Measure 4.6-56	Significant
Cumulative Biological Impacts	None Proposed or Required	Significant

Source: Biota Report for the Newhall Ranch Specific Plan (July 1996), Newhall Ranch Program EIR (March 1999) and Revised Additional Analysis (May 2003).
[a] *It has since been confirmed that this taxon does not occur on the Newhall Ranch Specific Plan site.*

3.2 PROJECT IMPACT SUMMARY

The Landmark Village project, including the necessary off-site project components, would result in the permanent conversion of, or temporary disturbance to, 373.60 acres of land currently used for agricultural purposes or otherwise substantially disturbed and/or developed, 123.58 acres of non-native grassland, 9.05 acres of coast live oak woodland, 12.50 acres of coastal sage chaparral scrub, 19.31 acres of mulefat scrub, 18.61 acres of southern cottonwood willow riparian forest, 305.13 acres of coastal sage scrub, 5.19 acres of southern willow scrub, 8.61 acres of river wash, 0.60 acre of alluvial scrub, 3.05 acres of great basin scrub, 8.22 acres of elderberry scrub, 6.45 acres of arrow weed scrub, 1.03 acre of freshwater marsh, and 8.82 acres of scalebroom scrub.

Significant impacts, as defined by CEQA, would occur with respect to the loss of mulefat scrub, coast live oak woodland, coastal sage scrub, elderberry scrub, southern willow scrub, southern cottonwood willow riparian forest, scalebroom scrub, valley freshwater marsh, wildlife habitat, special-status bird nests, special-status plant species, protected oaks, special-status wildlife species, and CDFG and ACOE jurisdictional resources.

Significant indirect impacts would occur with respect to increased light and glare, increased non-native plant species and increased human and domestic animal presence. However, the direct and indirect impacts associated with development and operation of the Landmark Village project are consistent with the findings of the Newhall Ranch Program EIR (March 1999) and Revised Additional Analysis (May 2003). Implementation of the mitigation measures required by the Newhall Ranch Program EIR, the Revised Additional Analysis, and the Specific Plan RMP, as well as the additional mitigation measures required by this Biota Report, would mitigate some, but not all, of the project-specific impacts identified by this report to a less than significant level. However, consistent with the findings of the Newhall Ranch Program EIR and Revised Additional Analysis, unavoidable significant impacts would occur with respect to the loss of many sensitive animal species, loss of coastal sage scrub, the overall loss of wildlife habitat and increased human and domestic animal presence. The project would also contribute to an unavoidable significant cumulative impact related to the ongoing loss of biological resources in the project region. **Table 3, Landmark Village Significant Biological Impacts**, summarizes the proposed project's impacts on biological resources, the applicable mitigation measures, the significance findings after the mitigation is implemented, and consistency with the findings of the Newhall Ranch certified environmental documentation.

Table 3
Landmark Village Significant Biological Impacts

IMPACT DESCRIPTION	Mitigation Measures	Final Conclusion After Mitigation	Consistent with Newhall Ranch Specific Plan and WRP EIR (NREIR)
Bio-1, Common Plant Communities			
Agricultural	None Required	Not Significant	The NREIR included the loss of this land use as part of the analysis of the overall loss of wildlife habitat (see **Bio-2, Wildlife Habitat Loss**).
Non-Native Grassland	None Required	Not Significant	The NREIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (see **Bio-2, Wildlife Habitat Loss**).
Mulefat Scrub	4.6-1–4.6-26, 4.6-63	Not Significant	The NREIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (see **Bio-2, Wildlife Habitat Loss**).
Coastal Sage Scrub	4.6-37–4.6-43	Significant	Yes
Elderberry Scrub	4.6-43, 4.6-96	Not Significant	Yes
Arrow Weed Scrub	None Required	Not Significant	The NREIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (see **Bio-2, Wildlife Habitat Loss**).
Alluvial Scrub	None Required	Not Significant	The NREIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (see **Bio-2, Wildlife Habitat Loss**).
Great Basin Scrub	None Required	Not Significant	The NREIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (see **Bio-2, Wildlife Habitat Loss**).
Coastal Sage Chaparral Scrub	None Required	Not Significant	The NREIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (see **Bio-2, Wildlife Habitat Loss**).
Bio-2, Wildlife Habitat Loss			
Habitat Loss Within the SMA/SEA 23	4.6-1–4.6-26	Not Significant	Yes
Habitat Loss Outside of SEA 23	4.6-27–4.6-43	Significant	Yes
Bio-3, Setbacks From Riparian Resources Within the SMA/SEA 23			
Riparian Setbacks	None Required	Not Significant	The Newhall Ranch Final Additional Analysis (May 2003) concluded that the proposed land use plan and other design features were sufficient to maintain the function and values of the riparian habitat within the SMA/SEA 23.

IMPACT DESCRIPTION	Mitigation Measures	Final Conclusion After Mitigation	Consistent with Newhall Ranch Specific Plan and WRP EIR (NREIR)
Bio-4, Common Wildlife Within and Outside of the SMA/SEA 23			
Common Wildlife	4.6-88	Not Significant	Not previously analyzed as an individual topic at the program level; the NREIR did include an analysis of the overall loss of wildlife habitat (see **Bio-2, Wildlife Habitat Loss**).
Bio-5, Wildlife Habitat Linkages Within and Outside of the SMA/SEA 23			
Wildlife Habitat Linkages	4.6-1–4.6-26	Not Significant	Consistent with the findings of the NREIR, the proposed project would not significantly alter wildlife movement along the river corridor but would limit northern access to or disbursement from the Santa Clara River. However, given that the tract map site is currently used for agriculture, the tract map site is not expected to be part of a regional north-south movement corridor. In light of the above, project-related impacts to regional wildlife movement would be less than significant.
Bio-6, Special-Status Plant Species			
Everlasting (possible new species)	4.6-100	Not Significant	Not previously analyzed as an individual topic at the program level.
Slender Mariposa Lily	4.6-99	Not Significant	Yes
Peirson's Morning-Glory	4.6-27, 4.6-34, 4.6-35, 4.6-53	Not Significant	Yes
Southern California Black Walnut	4.6-48	Not Significant	Yes
San Fernando Valley Spineflower	4.6-67, 4.6-68	Not Significant	Yes
Bio-7, Protected Oaks and Coast Live Oak Woodland			
Oaks	4.6-48, 4.6-98, 4.6-101	Not Significant	Yes
Bio-8, Special-Status Wildlife Species			
Santa Ana Sucker	4.6-57, 4.6-81–4.6-86	Not Significant	Yes
Unarmored Threespine Stickleback	4.6-54, 4.6-57, 4.6-59, 4.6-81–4.6-86	Not Significant	Yes
Arroyo Chub	4.6-57, 4.6-81–4.6-86	Not Significant	Yes
Silvery Legless Lizard	4.6-89, 4.6-98	Significant	Yes
Southwestern Pond Turtle	4.6-81–4.6-85, 4.6-89, 4.6-98	Not Significant	Yes
Two-Striped Garter Snake	4.6-81–4.6-85, 4.6-89, 4.6-98	Not Significant	Yes
Cooper's Hawk (nesting)	4.6-88	Not Significant	Yes
Lawrence's Goldfinch (nesting)	4.6-88	Not Significant	Not previously analyzed as an individual topic at the program level.
Northern Harrier (nesting)	4.6-88	Not Significant	The NREIR concludes that due to the substantial loss of habitat, impacts would remain significant; this finding is consistent with the findings of **Bio-2, Wildlife Habitat Loss**.
Yellow Warbler (nesting)	4.6-88	Not Significant	Yes
White-Tailed Kite (nesting)	4.6-88	Not Significant	The NREIR concludes that due to the substantial loss of habitat, impacts would remain significant; this finding is consistent with the findings of **Bio-2, Wildlife Habitat Loss.**
California Horned Lark (nesting)	4.6-88	Not Significant	Not previously analyzed as an individual topic at the program level.

IMPACT DESCRIPTION	Mitigation Measures	Final Conclusion After Mitigation	Consistent with Newhall Ranch Specific Plan and WRP EIR (NREIR)
Yellow-Breasted Chat (nesting)	4.6-88	Not Significant	Not previously analyzed as an individual topic at the program level.
Least Bell's Vireo (nesting)	4.6-88	Not Significant	Yes
Pallid Bat (roosting)	None Required	Not Significant	Yes
Southern California Rufous-Crowned Sparrow (nesting)	4.6-88	Not Significant	The NREIR concludes that due to the substantial loss of habitat, impacts would remain significant; this finding is consistent with the findings of **Bio-2, Wildlife Habitat Loss.**
San Diego Desert Woodrat	4.6-89, 4.6-98	Significant	Yes
Arroyo Toad	4.6-81–4.6-84	Not Significant	Yes
Western Spadefoot	4.6-97	Not Significant	Yes
Coastal Western Whiptail	4.6-89, 4.6-98	Significant	Yes
Rosy Boa	4.6-89, 4.6-98	Significant	Yes
San Bernardino Ringneck Snake	4.6-89, 4.6-98	Significant	Yes
Coast Horned Lizard	4.6-89, 4.6-98	Significant	Yes
Tricolored Blackbird (nesting)	4.6-88	Not Significant	The NREIR concludes that due to the direct loss of habitat, the breeding behavior of this species may be directly impacted by Specific Plan implementation, if there is a breeding colony established at the time of construction.
Long-Eared Owl (nesting)	4.6-88	Not Significant	Not previously analyzed as an individual topic at the program level.
Western Yellow-Billed Cuckoo (nesting)	4.6-88	Not Significant	Not previously analyzed as an individual topic at the program level.
Southwestern Willow Flycatcher (nesting)	4.6-88	Not Significant	Yes
Merlin (wintering)	None Required	Not Significant	Not previously analyzed as an individual topic at the program level.
Summer Tanager	4.6-88	Not Significant	Yes
Pale Big Eared Bat	4.6-90	Not Significant	Yes
Western Mastiff Bat	4.6-90	Not Significant	Yes
Fringed Myotis	4.6-90	Not Significant	Yes
Yuma Myotis	4.6-90	Not Significant	Yes
Mountain Lion	None Available	Not Significant	The NREIR concludes that due to the substantial loss of habitat, impacts would remain significant; this finding is consistent with the findings of **Bio-2, Wildlife Habitat Loss.**
Monarch Butterfly	None Required	Not Significant	Not previously analyzed as an individual topic at the program level.
Coast Patch-Nosed Snake	4.6-89, 4.6-98	Significant	Yes
Bell's Sage Sparrow (nesting)	4.6-88	Not Significant	The NREIR concludes that due to the substantial loss of habitat, impacts would remain significant; this finding is consistent with the findings of **Bio-2, Wildlife Habitat Loss.**
Western Burrowing Owl	4.6-88	Not Significant	The NREIR concludes that due to the substantial loss of habitat, impacts would remain significant; this finding is consistent with the findings of **Bio-2, Wildlife Habitat Loss.**
Loggerhead Shrike	4.6-88	Not Significant	Yes
San Diego Black-Tailed Jackrabbit	4.6-89, 4.6-98	Significant	Yes
American Badger	4.6-89, 4.6-98	Not Significant	Not previously analyzed as an individual topic at the program level.

IMPACT DESCRIPTION	Mitigation Measures	Final Conclusion After Mitigation	Consistent with Newhall Ranch Specific Plan and WRP EIR (NREIR)
Bio-9, Sensitive Plant Communities			
Southern Willow Scrub	4.6-1–4.6-26, 4.6-55, 4.6-63, 4.6-87	Not Significant	Yes
Southern Cottonwood Willow Riparian Forest	4.6-1–4.6-26, 4.6-55, 4.6-63, 4.6-87	Not Significant	Yes
Valley Freshwater Marsh	4.6-1–4.6-26, 4.6-55, 4.6-63, 4.6-87	Not Significant	Yes
Scalebroom Scrub	4.6-1–4.6-26, 4.6-55, 4.6-63, 4.6-87	Not Significant	Yes
Bio-10, Jurisdictional Resources			
ACOE and CDFG	4.6-1–4.6-26, 4.6-55, 4.6-63, 4.6-87	Not Significant	Yes
Indirect Impacts			
Increased Light and Glare	4.6-56	Not Significant	The NREIR concludes that implementation of the Newhall Ranch Specific Plan has the potential to indirectly impact adjacent natural areas and sensitive biological resources that occur proximal to the site. This would occur as a result of increased use of the Santa Clara River and upland areas by humans and domestic animals, increased use of adjacent natural areas by animals typical of an urban environment, and the potential effects of light, glare, and sediment and urban pollutant-laden runoff, unless mitigated.
Landscaping Irrigation and Stormwater Runoff	None Required	Not Significant	
Increased Populations of Non-Native Species	4.6-92, 4.6-93, 4.6-95	Not Significant	
Increased Human and Domestic Animal Presence	4.6-17–4.6-19	Significant	
Construction and Grading Activities	None Required	Not Significant	
Cumulative Biological Impacts			
Cumulative Impacts	None Proposed or Required	Significant	Yes

4.0 SETTING

4.1 GENERAL PROJECT SITE CHARACTERISTICS

The 292.6-acre Landmark Village tract map site is located on the Val Verde 7.5-minute USGS quadrangle map (**Figure 8**), and is in northwestern Los Angeles County, approximately 30 miles northwest of downtown Los Angeles. The site lies on flat terraces above the Santa Clara River. The majority of the site is currently used for agricultural purposes and is subject to agricultural disking. Topography across the site is relatively flat, with elevations ranging from 800 feet to 960 feet above msl. Habitat on the tract map site varies in quality from high biological value in riparian areas associated with the Santa Clara River channel, to highly disturbed habitat such as upland agricultural areas.

The borrow site south of the river is characterized by sloping hillsides and adjacent agricultural use. The borrow site is dominated by coastal sage scrub, but also includes areas of coastal sage chaparral scrub, non-native grassland and live oak woodland. Elevations on the borrow site range from approximately 920 feet (near the river) rising to 1,260 feet above msl further south. The Chiquito Canyon grading site is characterized by non-native grassland, coastal sage scrub vegetation, and agricultural/disturbed areas. Elevations at this off-site grading site range from approximately 970 feet near SR-126 rising to 1,190 feet above msl further north.

4.1.1 Significant Ecological Area Boundaries

SEA 23 was created in consideration of the resource values present in the river corridor.[4] SEA 23 provides habitat for Rare, Threatened and Endangered species; it is also noted for its critical habitat for the unarmored threespine stickleback and the least Bell's vireo, and habitat for other sensitive aquatic and riparian-associated plant and animal species. The portion of SEA 23 within the Newhall Ranch Specific Plan area is 975 acres in size. Of this acreage, 131.73 acres are within the Landmark Village project site boundaries. As shown in **Figure 9, River Corridor SMA/SEA 23 Boundary**, portions of the Landmark Village project site that are within or adjacent to the boundary of the Specific Plan's River Corridor SMA/SEA 23 include the southern edge of the tract map site, portions of the utility corridor, proposed bank stabilization locations along the southern bank of the Santa Clara River and within Castaic Creek, and the proposed Long Canyon Road Bridge and associated haul routes. Development of these uses is consistent with SEA CUP No. 94-087-(5) approved by the Board of Supervisors on May 23, 2003, as part of the project approvals for the Newhall Ranch Specific Plan and WRP.

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4 See, General Plan, p. LU-A14.

4.1.2 Soil Characteristics

According to the Antelope Valley Area Soil Survey (Soil Conservation Service 1970), 12 soil types occur on the project site: Cortina sandy loam (0 to 2 percent), Sandy alluvial land, Metz sandy loam (0 to 2 percent), Metz sandy loam (2 to 9 percent), Mocho loam (0 to 2 percent), Hanford sandy loam (0 to 2 percent), Hanford sandy loam (2 to 9 percent), Sorrento loam (0 to 2 percent), river wash, Castaic and Saugus soils (30 to 65 percent), Yolo loam (0 to 2 percent), and Zamora loam (9 to 15 percent). These soils are discussed below in **Table 4**, **On-Site Soils**, and the location of the mapped soil polygons are shown in **Figure 10, Project Site Soils**.

Artificial fill has been placed on the tract map portion of the project site as a result of road construction, oil well drilling activities, previous utility line placement, agricultural activities and the abandoned Southern Pacific railroad line. Artificial fill also exists at various locations on the borrow site and the Chiquito Canyon grading site, ranging from minor spill fills to large dumped fill pads associated with oil well activities.

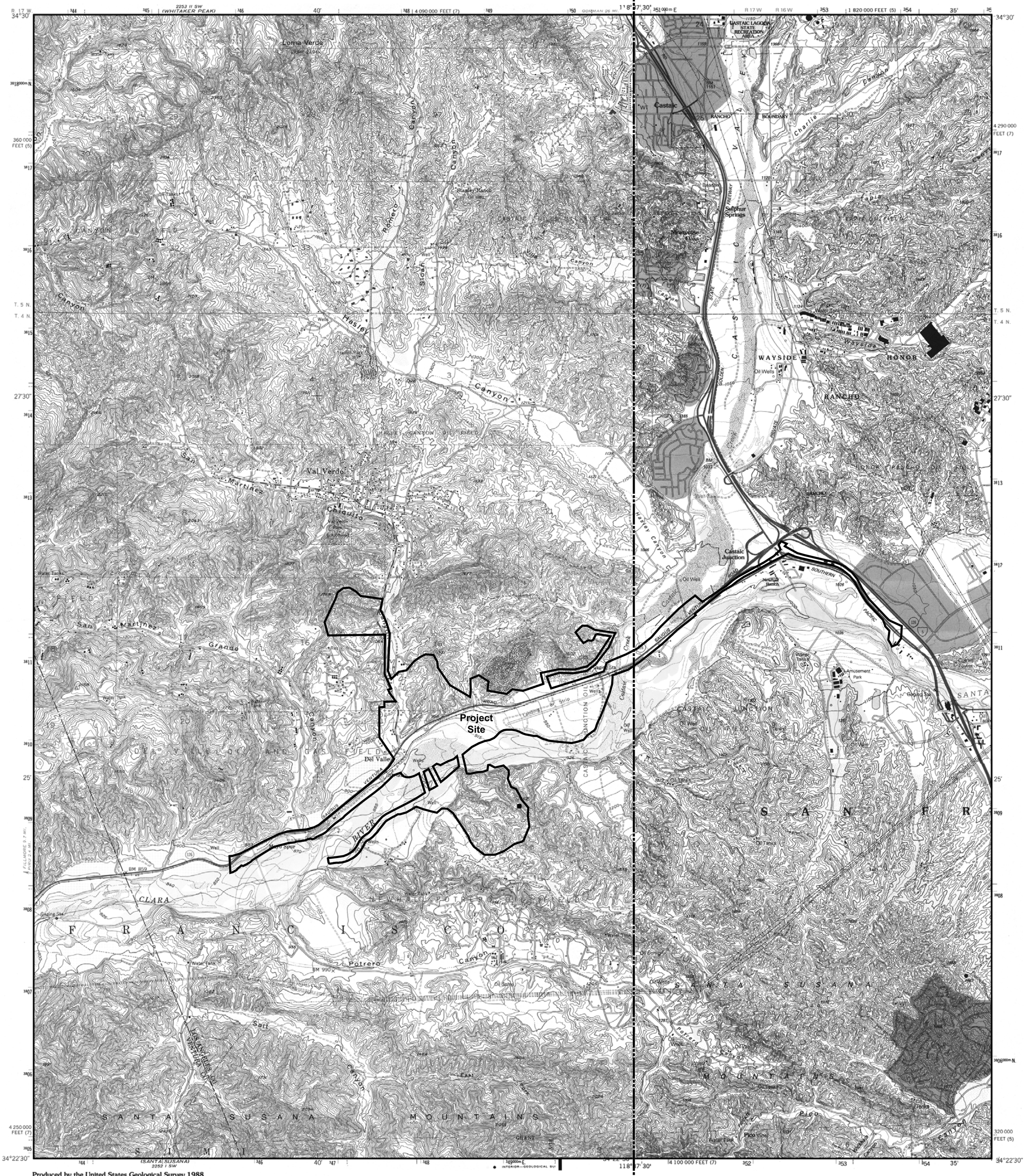
4.1.3 Drainage Patterns

The project site is located within the Santa Clara River basin and its watershed. The river borders the south side of the tract map site and flows from east to west through the Specific Plan area. The Chiquito Canyon drainage area borders the tract map site to the west, and the Castaic Creek drainage area borders the site to the east; both of these drainages are tributaries of the Santa Clara River. The drainages on and bordering the project site are discussed in more detail in **Section 9.3**.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

VAL VERDE QUADRANGLE (PARTIAL)
CALIFORNIA-LOS ANGELES CO.

NEWHALL QUADRANGLE (PARTIAL)
CALIFORNIA-LOS ANGELES CO.



Produced by the United States Geological Survey 1988
Revision by USDA Forest Service 1995

Topography compiled 1947. Planimetry derived from imagery taken 1988 and other sources. Public Land Survey System and survey control current as of 1995

North American Datum of 1927 (NAD 27). Projection and 10 000-foot ticks: California coordinate system, zones 7 and 5 (Lambert conformal conic) Blue 1000-meter Universal Transverse Mercator ticks, zone 11

North American Datum of 1983 (NAD 83) is shown by dashed corner ticks The values of the shift between NAD 27 and NAD 83 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software

Non-National Forest System lands within the National Forest Inholdings may exist in other National or State reservations

This map is not a legal land line or ownership document. Public lands are subject to change and leasing, and may have access restrictions; check with local offices. Obtain permission before entering private lands

Where omitted, land lines have not been established

GN MN 0°53' 16 MILS 14° 249 MILS

UTM GRID AND 1998 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

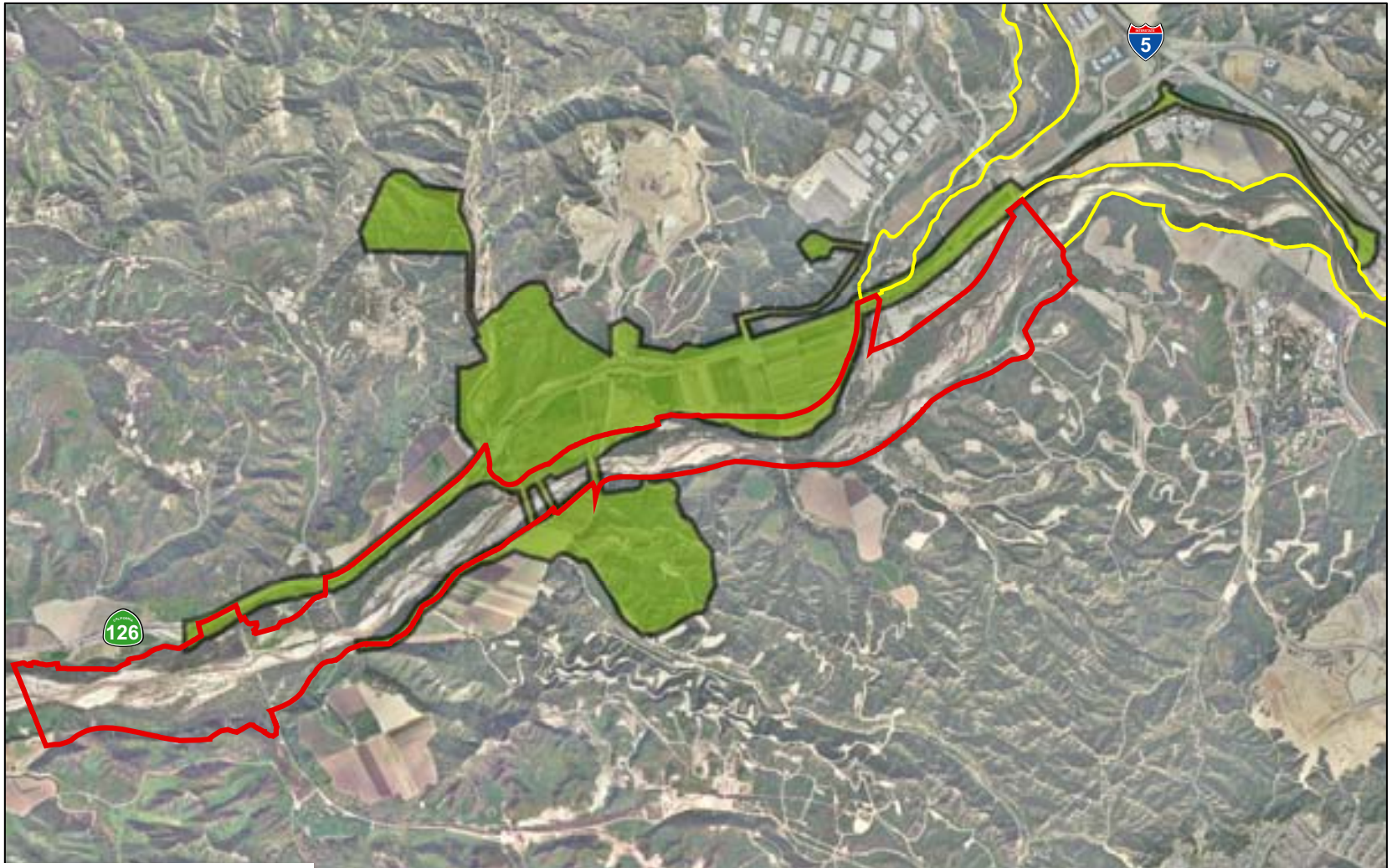
CONTOUR INTERVAL 25 FEET
DOTTED LINES REPRESENT 5 FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

CALIF.
QUADRANGLE LOCATION

ROAD CLASSIFICATION

Primary highway, hard surface — Light-duty road; hard or improved surface
Secondary highway, hard surface — Unimproved road
Interstate Route — U. S. Route — State Route

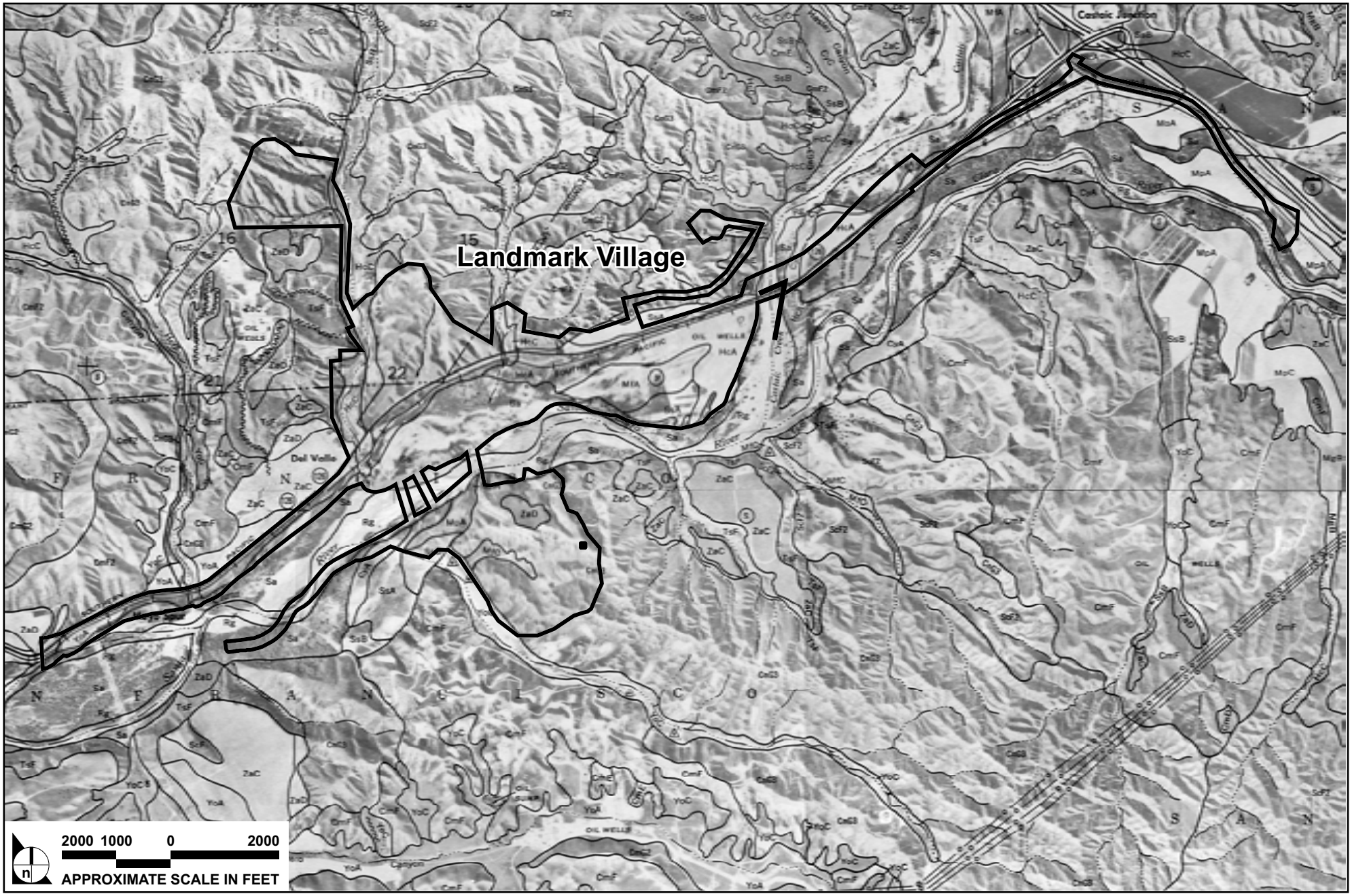


SOURCE: FORMA Systems – 2002, 2004, PSOMAS – 2005

FIGURE 9

River Corridor SMA/SEA 23 Boundaries

32-92•06/05



SOURCE: USDA Soil Conservation Service – January 1970, Impact Sciences, Inc. – May 2005

FIGURE **10**

Project Site Soils

32-92•07/05

Table 4
On-Site Soils

Mapped Soil	SOIL CHARACTERISTICS (Descriptive terms are defined as standard terms in SCS soil surveys.)	Associated Project-Site Plant Communities
Cortina Sandy Loam, 0 to 2 percent (CYA)	• Runoff is very slow; • Hazard of erosion is slight.	Agricultural, mulefat scrub
Sandy Alluvial Land (Sa)	• Mostly on floodplains along the Santa Clara River and its larger tributaries; • Consists of unconsolidated alluvium; • Ranges from sand to loamy sand in texture; • Hazard of soil blowing is moderate.	Agricultural, mulefat scrub, southern cottonwood willow riparian forest, arrow weed scrub
Metz Sandy Loam, 0 to 2% (MfA)	• Permeability is rapid; • Runoff is very slow; • Hazard of erosion is slight.	Agricultural
Metz Loamy Sand, 2 to 9% (MfC)	• Runoff is slow; • Hazard of erosion is slight.	Coastal sage scrub, coast live oak woodland
Mocho Loam, 0 to 2% (MpA)	• Moderately permeable; • Runoff is very slow; • Hazard of erosion is none to slight.	Agricultural, southern willow scrub
Hanford Sandy Loam, 0 to 2% (HcA)	• Runoff is slow; • Hazard of erosion is slight.	Agricultural, southern cottonwood willow riparian forest, annual grassland, southern willow scrub, elderberry scrub
Hanford Sandy Loam, 2 to 9% (HcC)	• Runoff is slow to medium; • Hazard of erosion is slight to moderate.	Agricultural, coastal sage scrub, great basin scrub, scalebroom scrub, non-native grassland
Sorrento Loam, 0 to 2% (SsA)	• On alluvial fans along the Santa Clara River and its major tributaries; • Runoff is very slow; • Hazard of erosion is slight.	Agricultural, cottonwood willow riparian forest
River Wash (Rg)	• Consists of sandy material in the beds of intermittent streams; • Hazard of soil blowing is slight to moderate.	River wash
Castaic and Saugus Soils, 30 to 65% (CnG3)	• Runoff is very rapid; • Hazard of erosion is very high.	Coastal sage scrub, coastal sage chaparral scrub
Zamora Loam, 9 to 15% (ZaD)	• Runoff is medium; • Hazard of erosion is moderate.	Coastal sage scrub
Yolo Loam, 0 to 2% (YoA)	• Permeability is moderate; • Runoff is very slow; • Hazard of erosion is none to slight.	Agricultural, cottonwood willow riparian woodland, freshwater marsh

5.0 METHODS

5.1 LITERATURE/DATABASE REVIEW

To evaluate the natural resources found or potentially occurring on the Landmark Village project site, literature searches and database reviews were conducted by Impact Sciences. Specifically, reports reviewed included the Biota chapter of the Newhall Ranch Program EIR as revised (March 1999), the Newhall Ranch Biota Report (July 1996), the Newhall Ranch Revised Additional Analysis (May 2003), Section 2.2, Salt Creek Corridor, Section 2.3, Floodplain Modifications, and Section 2.6, Spineflower and Other Sensitive Plant Species, and various technical reports documenting the biological surveys conducted on the project site and greater Newhall Ranch (**Table 5**). Literature sources specific to descriptions of the common plants and animals, plant communities and special-status species occurring in the County were also reviewed (**Section 14.0, References**).

In addition, the most recent versions of the California Natural Diversity Data Base (CNDDB) and the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants were reviewed for the USGS 7.5-minute quadrangle on which the project site is located (i.e., Val Verde) and the eight surrounding quadrangles (i.e., Newhall, Warm Springs Mountain, Whitaker Peak, Cobblestone Mountain, Piru, Simi Valley West, Simi Valley East and Oat Mountain) (**Appendix G**).

5.2 FIELD SURVEYS

All surveys were conducted by biologists qualified and/or permitted to conduct such surveys. Habitat and species observations were noted on data sheets, aerial photographs and maps. Specific information concerning a special-status species observed on site was recorded on appropriate data sheets. All surveys were conducted in accordance with published resource agency survey protocols, where they exist, or consistent with accepted survey methodologies for the particular species when published protocols did not exist. A summary of surveys dates, surveyors and methodologies are provided in **Table 5, Biological Surveys Conducted on the Landmark Village Site and Technical Reports Incorporated Into Biota Report**. The survey reports referenced in **Table 5**, which include additional information on specific methods used during the course of field surveys, are included in **Appendix E**. Resumes for biologists involved in the fieldwork and preparation of this report are included in **Appendix H**.

Table 5
Biological Surveys Conducted on the Landmark Village Site and Technical Reports Incorporated Into Biota Report

TAXONOMIC GROUP/TECHNICAL REPORT	SURVEYORS	SURVEY DATES/ SEASON	METHODS
Plant Surveys	**FLx**	May 5-27, 2001; October 16–17, 2002; May 31–June 3, June 15–17, and September 13–16, 2004	Focused plant surveys were conducted throughout the Newhall Ranch Specific Plan area by FLx in 2001 and 2002. The survey area included the project site (inclusive of the tract map). The 2004 surveys focused on the Santa Clara River Corridor. In addition, vegetation types and plant species associations were noted and their dominant species recorded. The surveys were floristic in nature and were conducted according to accepted scientific protocol.
	Dudek & Associates	May–August, 2002; May–August, 2003 April–July, 2004, and ongoing	Focused plant surveys were conducted throughout the Newhall Ranch Specific Plan area for special-status species. The survey area included portions of the Landmark Village site that provide suitable habitat for special-status plants, but did not include the portions of the tract map site currently used for agricultural activities. The surveys were floristic in nature and were conducted according to accepted scientific protocol.
Oak Tree Surveys	**Impact Sciences, Hendrickson**	2003–2004	Biologists conducted on-site surveys and evaluations of the oak trees pursuant to the Los Angels County Oak Tree Ordinance throughout the 2003 and 2004 year. The project site was traversed on foot through areas where oak trees occur. Oak trees were surveyed from the base of each tree. Only oak trees subject to the Los Angeles County Oak Tree Ordinance were surveyed.
Jurisdictional Delineation of Waters and Streambeds	**URS**	1992–2003	The focus of the delineation was the Santa Clara River and its tributaries within the Newhall Ranch Specific Plan area. Published ACOE/CDFG delineation protocols were utilized in the field.
Invertebrates	**Compliance Biology, Guy Bruyea**	April 10, 21, 25, 29, 30, May 2, 5, 6, 9, 16, 19, 20, 2004	The Newhall Ranch Specific Plan area was surveyed for a total 32-person days. The survey area included the project site (inclusive of the tract map). The primary focus of the surveys was to determine the presence or absence of San Emigdio blue butterfly, quino checkerspot butterfly and their associated host plants. A general butterfly inventory was also conducted.
Herpetofauna	**RECON**	March 15–May 30, 1999	Surveys for arroyo toads were conduced along portions of the Santa Clara River and Castaic Creek on the Newhall Ranch Specific Plan area. The surveys were conducted pursuant to U.S. Fish and Wildlife Service (USFWS) survey protocol.
	Ecological Sciences	April–June, 2001	Surveys for arroyo toad were conducted along portions of the Santa Clara River, Castaic Creek, San Francisquito Creek, Santa Clara River south fork and Bouquet Creek; the Landmark Village site is within survey "Zone 3." The surveys were conducted pursuant to USFWS survey protocol.
	Compliance Biology	March 19–June 25, 2004	Protocol surveys were conducted for arroyo toad that included the Landmark Village project site (inclusive of the tract map) reach. Surveys for southwestern pond turtle and two-striped garter snake were conducted concurrently with the arroyo toad surveys.
	Compliance Biology	March 9 and 23, 2004	All areas on the project site providing suitable breeding habitat for western spadefoot were identified. These areas were surveyed during the known breeding season of western spadefoot to determine their use by the species.
	ENTRIX	March 31, April 1, November 8, 10, 2004 February 1, 2005	Reconnaissance-level field surveys were conducted focusing on arroyo toad, California red-legged frog, southwestern pond turtle, two-striped garter snake and their associated habitat within the Santa Clara River floodplain. The purpose of the field surveys was to identify suitable habitat and to analyze potential effects of the Landmark Village project on these species and their habitat. Limited seining and dipnetting was also conducted.
	Impact Sciences	April–June, 2001	Protocol surveys were conducted for arroyo toad that included the Landmark Village project reach. Surveys for southwestern pond turtle and two-striped garter snake were conducted concurrently with the arroyo toad surveys.
Reptiles	**Impact Sciences**	September 2004; ongoing	Raking surveys for silvery legless lizards were performed in areas where lizards were most likely to occur within the project site (sandy soils with leaf litter within oak woodlands). In addition, one pitfall trap line was installed for detection of common and special-status reptile species.

TAXONOMIC GROUP/TECHNICAL REPORT	SURVEYORS	SURVEY DATES/ SEASON	METHODS
Birds	**Daniel Guthrie**	1993–2004; ongoing	Annual bird surveys, including protocol surveys for California gnatcatcher, least Bell's vireo, and southwestern willow flycatcher, have been conducted annually that include the Landmark Village project site (inclusive of the tract map).
Mammals	**Impact Sciences**	March–September, 2004; ongoing	Field surveys were conducted to sample mammal species in dominant plant communities throughout the Newhall Ranch Specific Plan area during 2004. Survey locations were in representative dominant plant communities within the Specific Plan area, including locations within the Landmark Village project site (inclusive of the tract map). Five different survey methods were utilized: small mammal trapping, scent/track stations, spotlighting, cameras, and ANABAT recording.
Fish	**Impact Sciences**	March–June, 2002	Focused surveys were conducted for unarmored threespine stickleback and other special-status fish species in the portion of the Santa Clara River from near its confluence with Castaic Creek, east (upstream) approximately 7.2 miles. (Note: the project site is adjacent to, but not within, the survey area.)
Water Quality	**GeoSyntec Consultants**	June 2005; ongoing	The Landmark Village Water Quality Technical Report addresses the potential impacts of the proposed project on water quality in the Santa Clara River. Potential changes in water quality are addressed for pollutants of concern based on runoff water quality modeling, literature information, and professional judgment.
Flood Technical Report	**PACE**	April 2005; ongoing	The Landmark Village Flood Technical Report assesses the hydrology and hydraulics of the Santa Clara River corridor as a result of proposed floodplain modifications associated with the Landmark Village project/tract map. The report analyzes impacts to aquatic and riparian habitats downstream of the project/tract map site.

6.0 BIOLOGICAL RESOURCES

6.1 PLANT COMMUNITIES AND LAND USES

A total of 15 plant communities and two existing land use (active agriculture and developed areas) were identified and characterized as occurring on the project site during the field investigations. Twelve of these plant communities, including non-native grassland, southern cottonwood-willow riparian forest, coast live oak woodland, coastal sage scrub, coastal sage chaparral scrub, elderberry scrub, arrow weed scrub, mulefat scrub, southern willow scrub, freshwater marsh, great basin scrub, and scalebroom scrub correspond with the *Vegetation Classification and Mapping Program, List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* (CDFG 2003). The remaining three described communities, ruderal, river wash and alluvial scrub, do not fit a defined plant community classification and, therefore, are defined by their dominant plant species. The plant communities and the land uses occurring on the project site are discussed below. The plant communities and land uses have been mapped on the project site as shown on **Figure 11, Plant Communities and Land Uses on the Landmark Village Project Site** and on **Figure 11A, Plant Communities and Land Uses on the Landmark Village Project Site with Conceptual Grading Plan.** A list of all plant species observed on the project site is included in **Appendix D.**

6.1.1 Agricultural

There are 373.60 acres of land on the project site actively used for agricultural purposes. The majority of the tract map site is used for agricultural purposes. At the time of the 2004 surveys that mapped to map the plant communities on the project site, the agricultural fields on the tract map site were fallow and contained non-native grasses and other ruderal vegetation. The agricultural fields are disked regularly.

6.1.2 Non-Native Grassland

There are 123.58 acres of disturbed non-native grasslands on the project site. These grasslands occur along the northwestern portion of the tract map site, and within the borrow site in Long Canyon and the Chiquito Canyon grading site. These areas are dominated by non-native grasses such as brome grasses (*Bromus diandrus, B. madritensis* ssp. *rubens, B. hordeaceus*), wild oats (*Avena fatua, A. barbata*) and rat-tail fescue (*Vulpia myuros* ssp. *myuros*), but also include herbaceous ruderal species such as red-stemmed filaree (*Erodium cicutarium*), dead nettle (*Lamium amplexicaule*), black mustard (*Brassica nigra*), milk thistle (*Silybum marianum*) and star-thistle (*Centaurea* spp.), as well as native grass species (less than ten percent) such as purple needlegrass (*Nasella pulchra*), valley needlegrass (*Nasella lepida*), one-sided bluegrass (*Poa segunda*), and few-flowered fescue (*Vulpia microstachys*).

6.1.3 Southern Cottonwood-Willow Riparian Forest

There are 18.61 acres of southern cottonwood-willow riparian forest on the project site. This community occurs on low terraces above the main channel of the Santa Clara River and along Castaic Creek. It consists of tall, open, broadleaved, winter-deciduous trees and is dominated by Fremont cottonwood (*Populus fremontii* ssp. *fremontii)* and willows (*Salix laevigata, S. exigua, S. lasiolepis).* Understory plants include mulefat (*Baccharis salicifolia),* arrow weed (*Pluchea sericea*), blue elderberry (*Sambucus mexicana*), mugwort (*Artemesia douglasiana),* hoary nettle (*Urtica dioica* ssp. *holosericea),* ripgut grass (*Bromus diandrus),* and alkali rye (*Leymus triticoides).* Two invasive plant species, giant reed (*Arundo donax*) and tamarix (*Tamarix ramosissima*), are common throughout this plant community.

6.1.4 Coast Live Oak Woodland

There are 9.05 acres of coast live oak woodland on the project site. This community occurs at the base of north-facing slopes in Chiquito Canyon and Long Canyon and is dominated by coast live oak (*Quercus agrifolia*). The understory is characterized by annual grasses, spiny redberry (*Rhamnus crocea*), skunkbrush (*Rhus trilobata*), blue elderberry, holly-leaf cherry (*Prunus ilicifolia* ssp. *ilicifolia*), wild cucumber (*Marah macrocarpus* var. *macrocarpus*), eucrypta (*Eucrypta chrysanthemifolia*), clarkias (*Clarkia* spp.) and bedstraw (*Galium* spp.).

6.1.5 Coastal Sage Scrub

There are 305.13 acres of coastal sage scrub on the project site. This community predominantly occurs on gentle to steep hill slopes within the Chiquito Canyon grading site and the borrow site, as well as in an isolated area in the northwest portion of the tract map site and within the utility corridor. Dominant native species found in this plant community include California buckwheat (*Eriogonum fasciculatum* var. *foliolosum*) and California sagebrush (*Artemisia californica*). Other common plants include various sages (*Salvia leucophylla, S. mellifera, S. apiana*), California broom (*Lotus scoparius*), California aster (*Lessingia filaginifolia* var. *filaginifolia*), California encelia (*Encelia californica*), giant wild-rye (*Leymus condensatus*) and chaparral mallow (*Malacothamnus fasciculatus*). The understory generally is sparse and contains native grasses, including foothill needlegrass (*Nassella lepida*) and native herbs such as wishbone bush (*Mirabilis californica*) and morning-glory (*Calystegia macrostegia*). Both Venturan and Riversidean coastal sage scrub communities occur on the project site, with the Venturan community occurring more commonly on northerly facing slopes and the Riversidean community being more common on southerly facing slopes. Neither of these sage scrub communities are considered of special status by CDFG as of the most recent *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* (CDFG 2003).

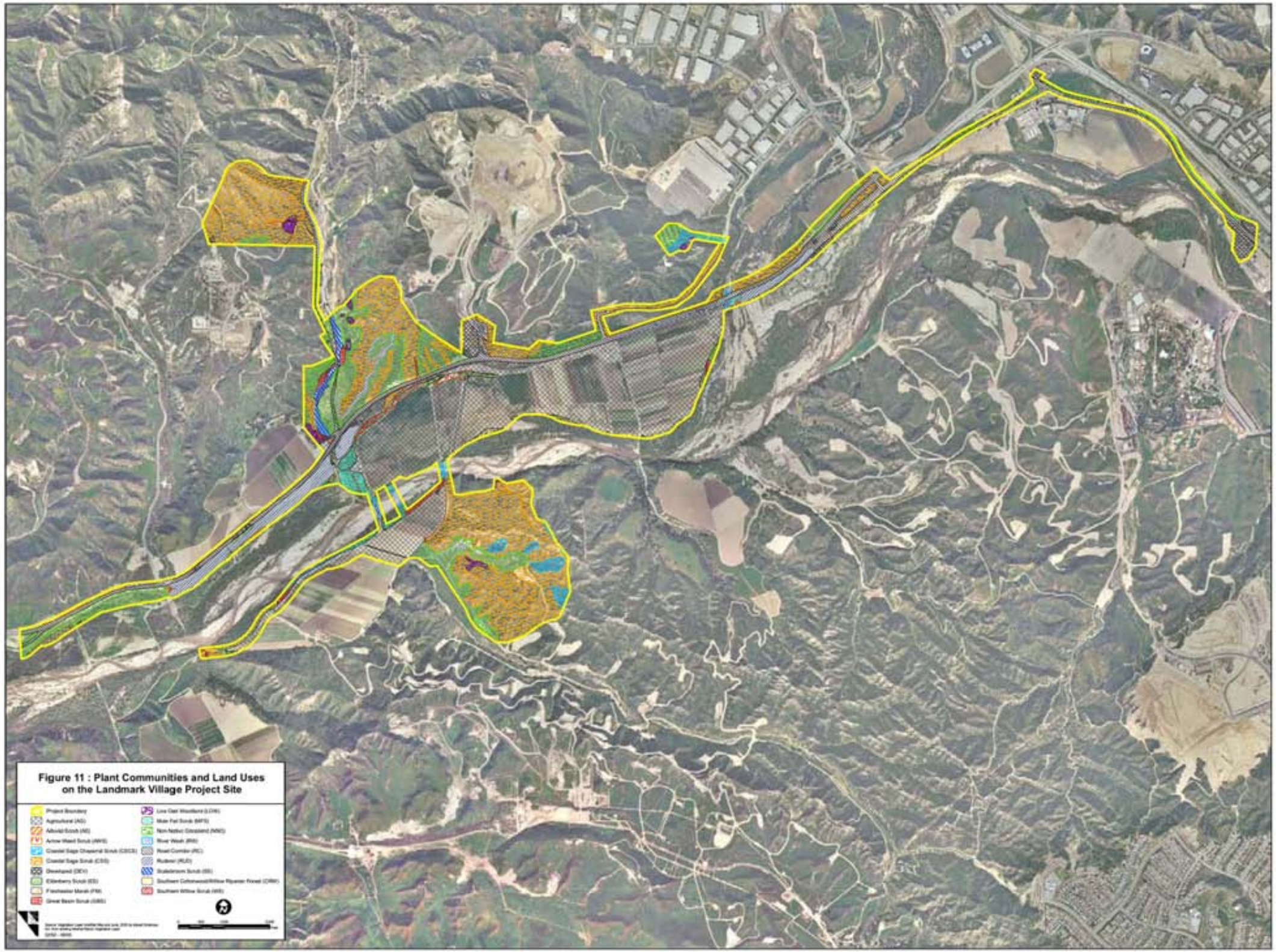


Figure 11 : Plant Communities and Land Uses on the Landmark Village Project Site
Project Boundary
Agricultural (AG)
Alluvial Scrub (AS)
Arrow Weed Scrub (AWS)
Coastal Sage Chaparral Scrub (CSCS)
Coastal Sage Scrub (CSS)
Developed (DEV)
Elderberry Scrub (ES)
Freshwater Marsh (FM)
Great Basin Scrub (GBS)
Low Oak Woodland (LOW)
Mule Fat Scrub (MFS)
Non-Native Grassland (NNG)
River Wash (RW)
Road Corridor (RC)
Ruderal (RUD)
Saltebrush Scrub (SS)
Southern Cottonwood/Willow Riparian Forest (CRW)
Southern Willow Scrub (WS)

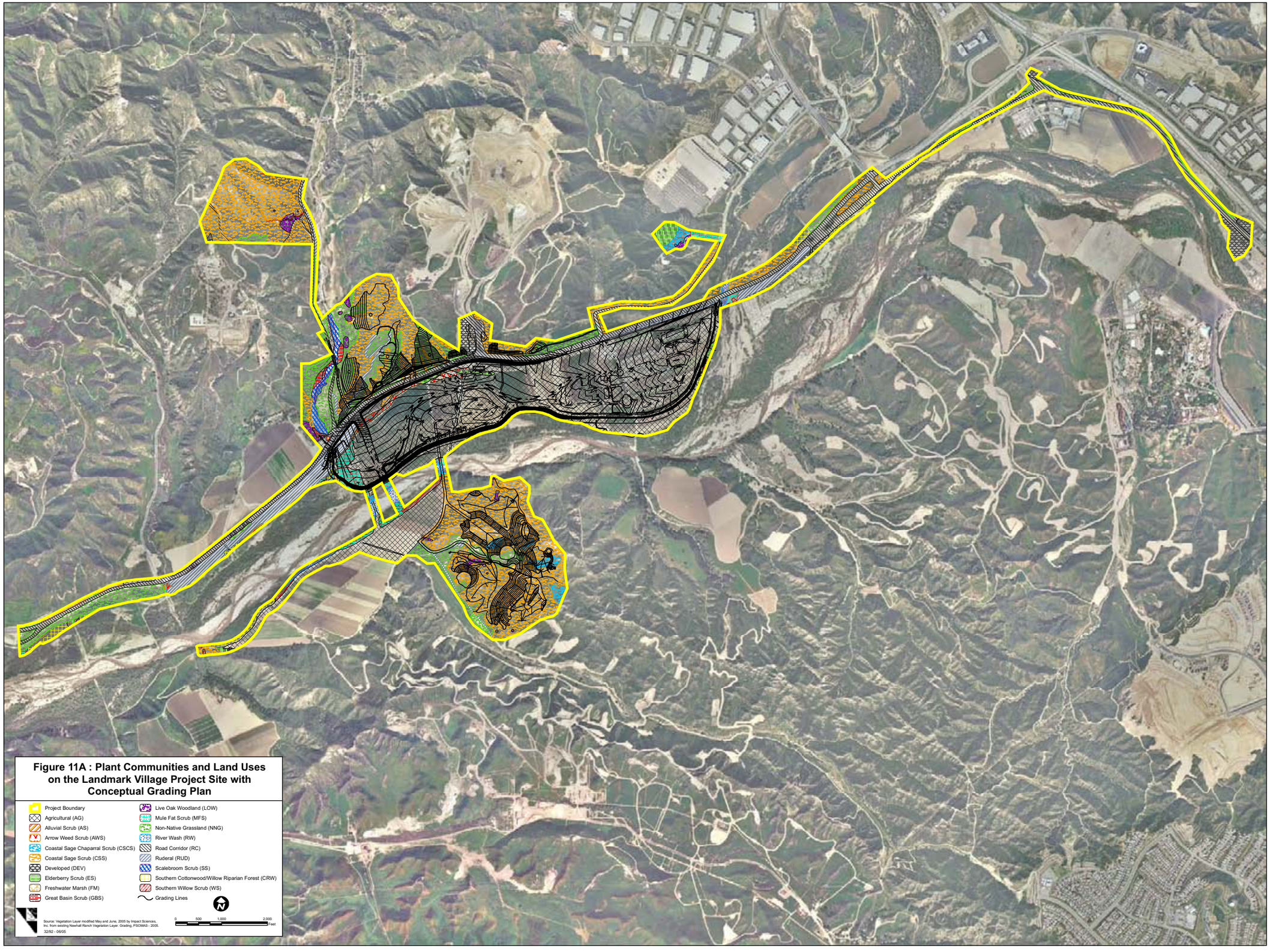


Figure 11A : Plant Communities and Land Uses on the Landmark Village Project Site with Conceptual Grading Plan

6.1.6 Coastal Sage Chaparral Scrub

There are approximately 12.50 acres of coastal sage chaparral scrub on the project site. The steepest north-facing slopes in Long Canyon support a mixed association of coastal sage scrub and chaparral species. Species found in this plant community include chamise (*Adenostoma fasciculatum*), hoary leaf ceanothus (*Ceanothus crassifolius*), black sage (*Salvia mellifera*), toyon (*Heteromeles arbutifolia*), California buckwheat, California encelia (*Encelia californica*), bush monkey flower (*Mimulus aurantiacus*), mountain mahogany (*Cercocarpus betuloides* var. *betuloides*), blue elderberry and heart-leaved penstemon (*Keckiella cordifolia*). The understory is poorly developed due to the dense vegetation cover. This plant community corresponds to the mixed chaparral community described in the Newhall Ranch Program EIR.

6.1.7 Elderberry Scrub

There are 8.22 acres of elderberry scrub on the project site. This plant community occurs in two locations in the northeast portion of the tract map site, as well as at the Commerce Center water tank site, within the utility corridor, and along the southern banks of the Santa Clara River. This community is characterized by thickets of blue elderberry, but also contains annual grasses and arrow weed. A row of large eucalyptus trees (*Eucalyptus globulus*) occurs adjacent to this plant community within the tract map site.

6.1.8 Arrow Weed Scrub

There are six stands of arrow weed scrub on the project site totaling 6.45 acres, located to the south of SR-126 (**Figure 11**). This plant community occurs in two locations in the northeast portion of the tract map site, as well as within the utility corridor. This community is characterized by a dense growth of arrow weed, but also contains scattered elderberry shrubs and annual grasses.

6.1.9 Mulefat Scrub

There are 19.31 acres of mule fat scrub on the project site. Several stands of this community occur in the western portion of the tract map site, adjacent to the river floodplain, near the water tank area, as well as within the utility corridor in locations within the floodplain of Castaic Creek and the Santa Clara River. The dominant species in this community are mulefat and arrow weed; tree tobacco (*Nicotiana glauca*), tamarisk and giant reed also are common. The understory is sparse or absent, but when present can include such species as Mexican rush (*Juncus mexicanus*), salt heliotrope (*Heliotropum curassavicum*) and annual grasses.

6.1.10 Southern Willow Scrub

There are 5.19 acres of southern willow scrub vegetation on the project site. This plant community is present in locations within the floodplain of Castaic Creek and the Santa Clara River. This community is dominated by willow shrubs (*Salix exigua, S. lasiolepis, S. laevigata*), but also includes mule fat and blue elderberry. The understory is sparse, with species such as mugwort, shrubby phacelia (*Phacelia ramosissima*) and annual grasses present.

6.1.11 River Wash

There are 8.61 acres of river wash within the project boundaries. The stretch of the Santa Clara River occurring within and bordering the location of the proposed bridge and haul routes, as well as areas within Chiquito Canyon Creek, are sparsely vegetated and subject to scouring by seasonal storm flows. Soils are sandy riverwash and gravel, and in places form sand bars and low terraces within the channels. Shrub species occurring in and adjacent to the channel include mulefat, sandbar willow, tamarisk, scale-broom, sandwash groundsel (*Senecio flaccidus* var. *douglasii*), big saltbush (*Atriplex lentiformis* ssp. *lentiformis*) and Great Basin sagebrush (*Artemisia tridentata*). Smaller species growing in the riverbed include white sweetclover (*Melilotus albus*), buckwheat (*Eriogonum baileyi*), cocklebur (*Xanthium strumarium*), California croton (*Croton californicus*), California evening primrose (*Oenothera californica* ssp. *californica*), Mediterranean schismus (*Schismus barbata*), foxtail chess and annual bur-sage (*Ambrosia acanthicarpa*).

6.1.12 Freshwater Marsh

There are three small stands of freshwater marsh on the project site within the main and secondary channels of the Santa Clara River, totaling 1.03 acres. This community typically is dominated by emergent perennial monocots, often up to 5 meters tall and forming closed canopies. Species found in the wettest parts of the channels include cattail (*Typha latifolia, T. domingensis*), smartweed (*Polygonum hydropiperoides, P. punctatum*), bulrush (*Schoenoplectus acutus* var. *occidentalis, S. pungens*), nutsedge (*Cyperus odoratus*), water primrose (*Ludwigia peploides* ssp. *peploides*), watercress (*Nasturtium officinale*), sticky willow-weed (*Epilobium ciliatum* ssp. *ciliatum*) and water speedwell (*Veronica anagallis-aquatica*).

6.1.13 Alluvial Scrub

There is 0.60 acre of alluvial scrub on the project site. This plant community occurs within the Chiquito Canyon water tank site, and in small pockets at the base of Chiquito Canyon and within the utility corridor. This plant community is characterized as a mixture of shrubs that colonize alluvial materials within intermittent creeks, arroyos and the drier terraces within large washes. Plant species observed in this plant community include big sagebrush, scalebroom (*Lepidospartum squamatum*), blue elderberry, big saltbush (*Atriplex lentiformis*) and squaw bush (*Rhus trilobata*), with some areas having high densities of big sagebrush.

6.1.14 Great Basin Scrub

There are 3.05 acres of great basin scrub on the project site. This plant community occurs along the outer margins of the floodplains of Chiquito Creek and the Santa Clara River. Great basin scrub is characterized by an almost pure stand of Great Basin sagebrush.

6.1.15 Scalebroom Scrub

There are 8.82 acres of scalebroom scrub on the project site. This plant community occurs along portions of Chiquito Creek. Similar to alluvial scrub, scalebroom scrub is characterized by homogeneous stands of scalebroom that grow in arroyos and washes.

6.1.16 Other Developed Land Uses

There are 20.67 acres of developed lands with the project area. These areas primarily include parking lots and commercial areas along the eastern utility corridor and various impermeable surfaces throughout the project site.

6.1.17 Ruderal Vegetation

A total of 47.90 areas on the project site comprise of ruderal areas. These areas mostly include portions of the site that are mostly void of vegetation located immediately adjacent to SR-126 and Chiquito Canyon Road.

6.2 COMMON WILDLIFE

Discussed below are representative common wildlife species (those not provided a sensitivity status by regulatory agencies) that were observed on the project site during the field surveys. A complete list of wildlife species observed or potentially occurring on the Landmark Village project site is provided in **Appendix D**. Special-status wildlife species observed or potentially occurring on the project site are discussed in **Section 9.0, Sensitive Biological Resources**.

6.2.1 Amphibians and Reptiles

The Santa Clara River is perennial in the vicinity of the Landmark Village site and provides habitat for amphibians. Western toad (*Bufo boreas)*, Pacific chorus frog (*Pseudacris regilla*) and California chorus frog (*Pseudaris cadaverina*), all of which are common in the project area, have been observed in the portion of the river bordering the project site. Additionally, numerous tadpoles, juveniles and adult forms of the invasive African clawed frog (*Xenopus laevis*) were observed throughout backwater areas of the Santa Clara River along and adjacent to the project site (Compliance Biology 2004). No other amphibian species have been observed or detected during the site surveys.

Common reptile species observed on the project site include western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), red coachwhip (*Masticophis flagellum piceus*), San Diego alligator lizard (*Elgaria malticarinata webbii*), western skink (*Eumeces skiltonianus*), San Diego gopher snake (*Pituophis catenifer annectens*), common kingsnake (*Lampropeltis getulus*) and southwestern rattlesnake (*Crotalus viridis helleri*).

6.2.2 Birds

The agricultural and scattered grassland areas on the tract map site provide foraging habitat for a number of raptor species, including turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*) and American kestrel (*Falco sparverius*). The eucalyptus trees along the northern portion of the tract map site provide nesting habitat for raptors. Other bird species observed within the agricultural and grassland portions of the project site include American robin (*Turdus migratorius*), house finch (*Carpodacus mexicanus*), savannah sparrow (*Passerculus sandwichensis*), Brewer's blackbird (*Euphagus cyanocephalus*), house sparrow (*Passer domesticus*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), European starling (*Sturnus vulgaris*) and white-throated swift (*Aeronautes saxatalis*).

The riparian habitats on and bordering the project site provide nesting and foraging habitat for numerous bird species. Bird species observed within the riparian plant communities include bushtit (*Psaltriparus minimus*), Wilson's warbler (*Wilsonia pusilla*), orange-crowned warbler (*Vermivora celata*), black phoebe (*Sayornis nigricans*), Bewick's wren (*Thryomanes bewickii*), brown-headed cowbird (*Molothrus ater*), wrentit (*Chamaea fasciata*) and numerous other species.

Bird species observed within the coastal sage scrub and chaparral habitats on the two off-site grading sites include California towhee (*Pipilo crissalis*), canyon wren (*Catherpes mexicanus*), rock wren (*Salpinctes obsoletus*), western scrub-jay (*Aphelocoma californica*), California thrasher (*Toxostoma redivivum*) and hermit thrush (*Catharus guttatus*).

In addition, cliff swallow (*Petrochelidon pyrrhonota*) has been observed nesting under the SR-126/Castaic Creek Bridge.

6.2.3 Mammals

A variety of common mammal species occur in the vicinity of the project site. During mammal surveys (which included small mammal trapping for rodents) conducted at the two off-site grading sites in 2004, the following common species were observed or identified by tracks, scat, or other sign: mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), desert cottontail (*Sylvilagus auduboni*), California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), raccoon (*Procyon lotor*), gray fox (*Urocyon cinereoargenteus*), striped skunk (*Mephitis mephitis*), western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), dusky-footed woodrat (*Neotoma fuscipes*), California mouse (*Peromyscus californicus*), California pocket mouse (*Chaetodipus californicus*), California vole (*Microtus californicus*) and Pacific kangaroo rat (*Dipodomys agilis*).

7.0 CHARACTERISTICS OF SURROUNDING AREA

7.1 EXISTING LAND USES

Land use types surrounding the site include the following: to the north, scattered rural and urban residential uses (the communities of Val Verde and San Martinez Grande), landfill uses (Chiquito Canyon Landfill), oil and natural gas production uses, high-intensity business park uses (Valencia Commerce Center), urban single-family homes and low-intensity commercial uses (Castaic corridor) and undeveloped areas; to the east, an existing WRP (Valencia WRP 32), a California Highway Patrol station, high-intensity commercial/recreational uses (Magic Mountain Theme Park), hotels, restaurants and service stations adjacent to I-5, urban density residential uses (to the southeast) and undeveloped areas; to the south and to the west, agricultural fields, citrus orchards, oil and natural gas production sites and undeveloped areas.

7.2 REGIONAL PLANT COMMUNITIES

Plant communities in the immediate vicinity of the Landmark Village project site consist of coastal sage scrub, live oak woodland, coastal sage chaparral scrub, chamise chaparral, non-native grassland, willow woodland, willow scrub, cottonwood/willow forest, mulefat scrub and freshwater marsh. Essentially all of these plant communities are represented to some degree on or bordering the project site.

7.3 REGIONAL OPEN SPACE AREAS

Figure 12, Regional Open Space Areas, illustrates the location and distribution of major public and private open space in the vicinity of the project site. Provided below is a listing of these areas as shown in **Figure 12**, separated as *existing* public areas and *proposed* public areas.

<u>Public (existing)</u>

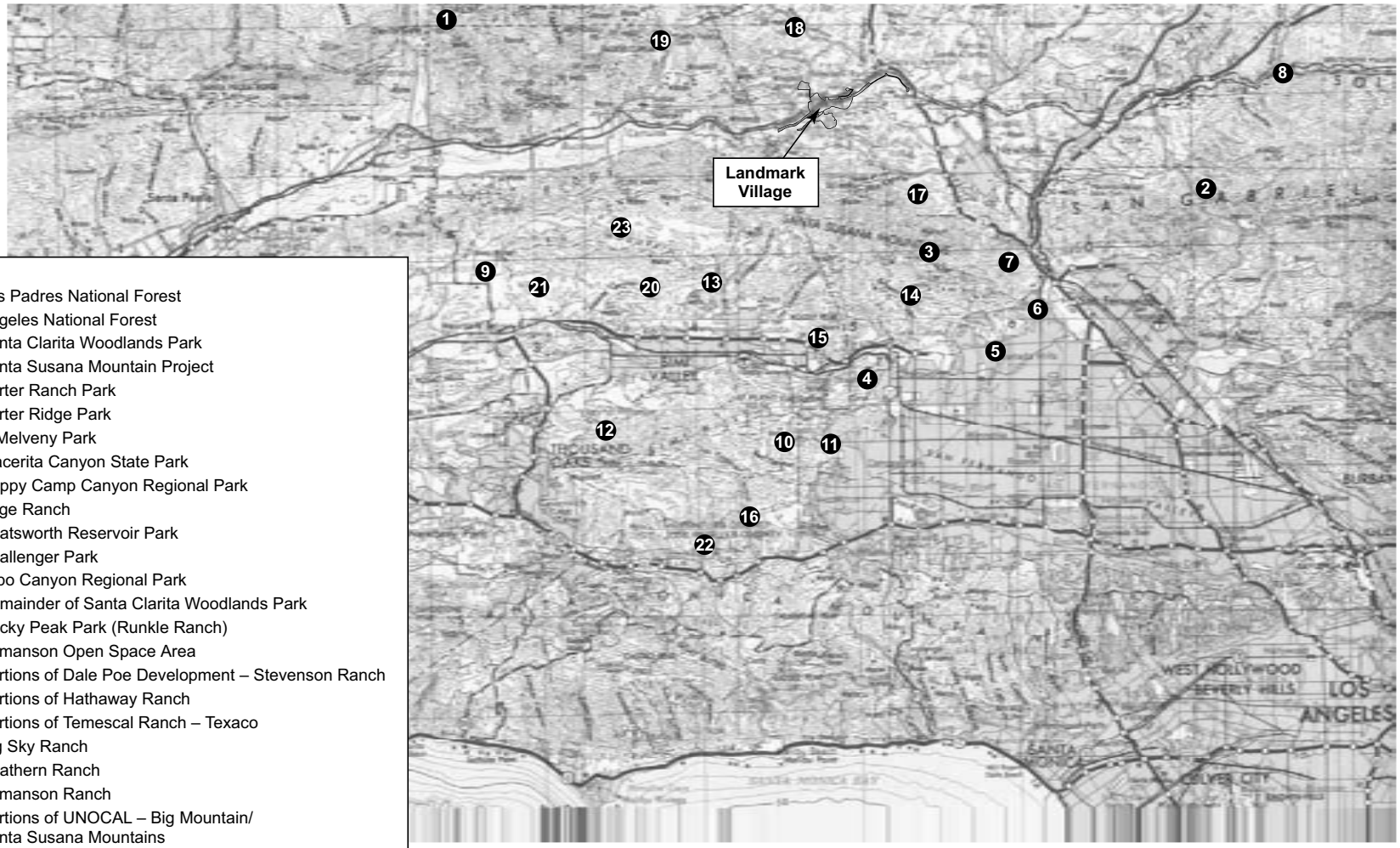
1. Los Padres National Forest, including the Sespe Condor Sanctuary;
2. Angeles National Forest;
3. Santa Clarita Woodlands Park;
4. Santa Susana Mountain Project;
5. Porter Ranch Park;
6. Porter Ridge Park;
7. O'Melveny Park;

8. Placerita Canyon Regional Park;
9. Happy Camp Canyon Regional Park;
10. Sage Ranch;
11. Chatsworth Reservoir Park;
12. Challenger Park;
13. Tapo Canyon Regional Park; and
16. Ahmanson Ranch Open Space Area.

<u>Public (proposed)</u>

14. Remainder of Santa Clarita Woodlands Park;
15. Rocky Peak Park (Runkle Ranch);
17. Portions of Dale Poe Development – Stevenson Ranch;
18. Portions of Hathway Ranch;
19. Portions of Temescal Ranch-Texaco;
20. Big Sky Ranch;
21. Strathern Ranch;
22. Ahmanson Ranch; and
23. Portions of UNOCAL - Big Mountain/Santa Susana Mountains.

NOTE: Numbering of this list corresponds with the numbering presented on **Figure 12**.



Legend:

1. Los Padres National Forest
2. Angeles National Forest
3. Santa Clarita Woodlands Park
4. Santa Susana Mountain Project
5. Porter Ranch Park
6. Porter Ridge Park
7. O'Melveny Park
8. Placerita Canyon State Park
9. Happy Camp Canyon Regional Park
10. Sage Ranch
11. Chatsworth Reservoir Park
12. Challenger Park
13. Tapo Canyon Regional Park
14. Remainder of Santa Clarita Woodlands Park
15. Rocky Peak Park (Runkle Ranch)
16. Ahmanson Open Space Area
17. Portions of Dale Poe Development – Stevenson Ranch
18. Portions of Hathaway Ranch
19. Portions of Temescal Ranch – Texaco
20. Big Sky Ranch
21. Strathern Ranch
22. Ahmanson Ranch
23. Portions of UNOCAL – Big Mountain/ Santa Susana Mountains

NOT TO SCALE

SOURCE: USGS 1:250,000 Scale Map, Los Angeles Quadrangle, Impact Sciences, Inc. – May 2005

FIGURE **12**

Regional Open Space Areas

32-92•05/05

8.0 WILDLIFE HABITAT LINKAGES

Wildlife corridors are described as pathways or habitat linkages that connect discrete areas of natural open space otherwise separated or fragmented by topography, changes in vegetation and other natural or human induced factors such as urbanization. The fragmentation of natural habitat creates isolated "islands" of vegetation that may not provide sufficient area or resources to accommodate sustainable populations for a number of species. This isolation, which may adversely affect both genetic and species diversity, often can be partially or largely mitigated by wildlife movement corridors. These corridors (1) allow animals to move between remaining habitats to replenish depleted populations and increase the available gene pool; (2) provide escape routes from fire, predators and human disturbances, thus reducing the risk that catastrophic events (such as fire or disease) will result in population or species extinction; and (3) serve as travel paths for individual animals moving throughout their home range in search of food, water, mates and other needs, or for dispersing juveniles in search of new home ranges.

The following discussion of wildlife movement and habitat linkages with respect to the project site and surrounding open space areas is based on extensive field visits of these areas that have occurred during varying seasons over the past decade by numerous biologists surveying and studying the Newhall Ranch Specific Plan area, particularly in association with the Newhall Ranch Program EIR, the Final Additional Analysis and the related BCA and Biota Report for the Specific Plan. It is also based on (i) a review of available aerial photography and mapping of the Specific Plan and adjacent watersheds in both Los Angeles County and Ventura County; (ii) an evaluation of habitat types and distribution associated with the Landmark Village project site and surrounding areas; and (iii) a review of the animal species known to use or expected to utilize these habitats. While numerous observations have been made over the past decade of a variety of wildlife species within and adjacent to the Specific Plan area (including the Landmark Village site), the focus of this discussion is from a watershed and habitat perspective as the preservation of habitats within watersheds that link remaining open space areas is critical to providing movement corridors for the variety of wildlife species that occur in the Specific Plan area, inclusive of the Landmark Village project site.

The Landmark Village project site, indeed the Newhall Ranch Specific Plan area, is part of a larger regional wildlife movement interface that exists between the Los Padres/Angeles National Forest, the Santa Clara River, and the Santa Susana Mountains. This interface spans a distance of approximately 35 miles, from approximately Saticoy on the west in Ventura County to Castaic Junction on the east in Los Angeles County. The Santa Clara River forms the central east-west corridor of this interface, extending throughout the Newhall Ranch Specific Plan area and west into Ventura County. As shown on **Figure 13**,

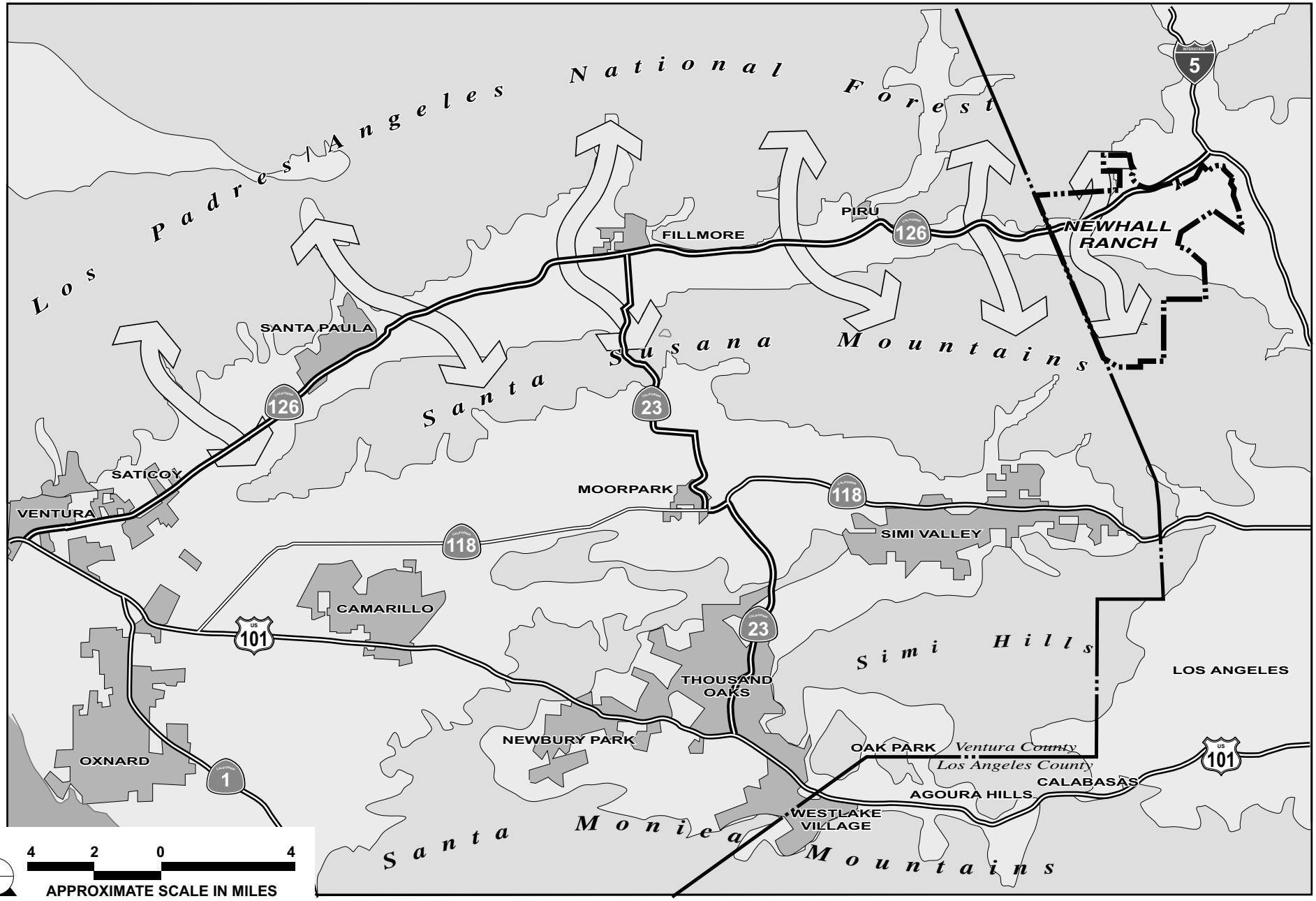
Potential Wildlife Movement Corridors, the Newhall Ranch Specific Plan site represents an approximately 2- to 5-mile-wide portion (6 to 14 percent) of this 35-mile-wide interface.

The Santa Clara River flows from its origins in the San Gabriel Mountains to where it eventually empties into the Pacific Ocean approximately 50 miles to the west. The river is an important migration and genetic dispersion corridor for many wildlife species, including aquatic taxa, riparian obligate species (resident and migratory) and larger, more mobile terrestrial animals.

Within the Newhall Ranch Specific Plan area, south of the Santa Clara River, several watersheds, including Long Canyon, Potrero Creek, and Salt Creek, are directly connected to the Santa Clara River through their own drainage systems, providing potential wildlife movement routes between the river and the Santa Susana Mountains to the south. These watersheds serve to provide habitat linkages between the High Country areas (to be preserved) within the Newhall Ranch Specific Plan to the Santa Clara River. Other watersheds, including Chiquito Canyon, San Martinez Grande, and Castaic Creek, connect the river to open space areas to the north and eventually the Angeles/Los Padres National Forests.

Chiquito Canyon borders the project site to the west and the Castaic Creek drainage borders the site to the east. Both of these drainages are tributaries of the Santa Clara River and serve as suitable habitat/movement corridors for wildlife route from the river to the north towards the Angeles and Los Padres National Forests. Given the presence of a tunnel underneath SR-126 (located at the northern end of the agricultural drainage on the project site), wildlife could cross under SR-126 and continue to move north through the northern portion of Chiquito Canyon.

As previously stated, the majority of the tract map site is actively used for agricultural purposes and is disked regularly. These activities, and the lack of native vegetation cover, limit the use of the main portion of the site as a movement corridor for most species of wildlife. While several species are expected to occasionally forage over and within these agricultural areas, most species, with respect to local and regional movement patterns, are expected to use Chiquito Canyon to the west and/or Castaic Creek to the east when moving to or from the Angeles/Los Padres National Forest areas, or when generally moving out of the river corridor into adjacent upland areas. Consequently, the Landmark Village project site itself is not expected to serve as a locally or regionally important wildlife movement corridor.



SOURCE: Newhall Ranch Specific Plan Revised Draft – May 1999

FIGURE **13**

Potential Wildlife Movement Corridors

32-92•07/05

Nevertheless, as stated in the certified Newhall Ranch Program EIR, p. 4.6-49, implementation of the Specific Plan over the long-term would still significantly and unavoidably impact the movement of resident wildlife species on the Specific Plan site due to the reduction of open land available for wildlife movement between the river and upland areas within Los Angeles County. In response to this significant unavoidable impact, the County's Board of Supervisors adopted mitigation and an off-site condition that minimized such impacts, but also found that the remaining unavoidable effects were acceptable based on overriding considerations set forth in the adopted Statement of Overriding Considerations.[5]

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5 See, Section 10, Statement of Overriding Considerations, contained in the "Additional CEQA Findings and Statement of Overriding Considerations Regarding the Newhall Ranch Final Additional Analysis to the Partially Certified Final EIR for the Newhall Ranch Specific Plan and Water Reclamation Plant," dated May 2003, at pp. 78–85.

9.0 SENSITIVE BIOLOGICAL RESOURCES

The following discussion focuses on those species and plant communities considered by state and/or federal resource agencies, and by recognized conservation organizations, to be of special status, that are known to occur, or could potentially occur, on the project site. A list of all plant and wildlife species, both common and special status, observed or expected to potentially occur on the project site is found in **Appendix D**.

9.1 SPECIAL-STATUS PLANTS

Special-status plants include those species that are state or federally listed as Rare, Threatened or Endangered; federal candidates for listing; proposed for state or federal listing; or included on Lists 1, 2, 3 or 4 of the CNPS Inventory of Rare and Endangered Plants of California (CNPS Inventory). Plants included on the CNPS Inventory are classified as follows: List 1A: plants presumed extinct in California; List 1B: plants Rare, Threatened, or Endangered in California and elsewhere; List 2: plants Rare, Threatened or Endangered in California, but more common elsewhere; List 3: plants about which more information is needed-a review list; and List 4: plants of limited distribution-a watch list.

Based on a review of the CNDDB and CNPS databases and the survey reports prepared for the Newhall Ranch Specific Plan area and the project site, a total of 41 special-status plant species were identified as occurring in the region. This list formed the basis of the following analysis, wherein each of the identified species is addressed in one of the following two sections: **Section 9.1.1** addresses the special-status plant species observed on or near the site during focused surveys; and **Section 9.1.2** addresses the special-status plant species that are known to occur in the project area, but were not observed on or adjacent to the project site during focused surveys. **Table 5**, above, details the specificity of the focused surveys.

9.1.1 Special-Status Plant Species Observed on or Adjacent to the Project Site

Special-status plant species that were observed on the project site during focused surveys include slender mariposa lily (*Calochortus clavatus* var. *gracilis*), Peirson's morning-glory (*Calystegia peirsonii*) and California walnut (*Juglans californica* var. *californica*). In addition, a potentially undescribed species of everlasting (*Gnaphalium* sp. *Nova)* was observed. While this plant currently has no sensitivity status, it is described in this report because of its unique nature and potential to be assigned a sensitivity status in the future. San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) was observed in areas bordering the borrow site. These five species are discussed in more detail below, and their locations with

respect to on the project site are shown in **Figure 14, Special-Status Plant Species On and Bordering the Project Site**. Known locations of special-status plant species adjacent to the project site were only mapped if they occurred within 200 feet of the project site boundary.

Slender mariposa lily is a CNPS List 1B plant, but has no state or federal status. This species is typically found in chaparral, coastal sage scrub and grasslands, often on clay and/or rocky soils. Populations of this species have been documented on the project's borrow site, the Chiquito Canyon grading site, the Valencia Commerce Center water tank site, and the reclaimed water tank sites in Chiquito Canyon. These populations contain an estimated total of 887 plants (Dudek & Associates 2004). Approximately 68,888 slender mariposa lily plants were observed in the greater Newhall Ranch Specific Plan area during the 2004 plant surveys (Dudek & Associates 2004).

Peirson's morning-glory is a CNPS List 4 plant, but has no state or federal status. This species has been documented within the project's borrow site and the Chiquito Canyon grading site (FLx 2002). While not abundant, Peirson's morning-glory occurs throughout the Newhall Ranch Specific Plan area on virtually all ridges and slopes, weakly climbing over mixed chaparral, California sagebrush, California buckwheat and in annual grasslands (Dudek & Associates 2002). Given its widespread occurrence, individual populations of this species have not been mapped.

Southern California black walnut is a CNPS List 4 plant, but has no state or federal status. The only stand of this species within the project site occurs along Chiquito Canyon, which includes a total of 10 trees.

A potentially undescribed species of **everlasting** (*Gnaphalium* sp. *Nova*) was documented within the study area during the 2003 and 2004 field seasons. Two main populations of this undescribed species, totaling about 600 individuals, were documented in 2003 in the Santa Clara River and in Castaic Creek south of SR-126 (Dudek & Associates 2004). During the 2004 surveys conducted by FLx, these two occurrences were noted again with about 700 plants. In addition, a population of about 250 individuals was observed in the portion of Castaic Creek west of the I-5 bridge and east of Commerce Center Drive. One of these populations was documented as partially occurring within the proposed utility corridor (to the east of the tract map site) while the other population was documented within the proposed haul route across the Santa Clara River. On May 27, 2005, Dudek & Associates surveyed the project site to evaluate the current condition of these populations of everlasting. No populations of everlasting were observed on or near the project footprint during these surveys. The large storm events of 2005 and associated large flows within Castaic Creek and the Santa Clara River resulted in extensive scouring and the removal of the terraces and benches on which the plants previously occurred.

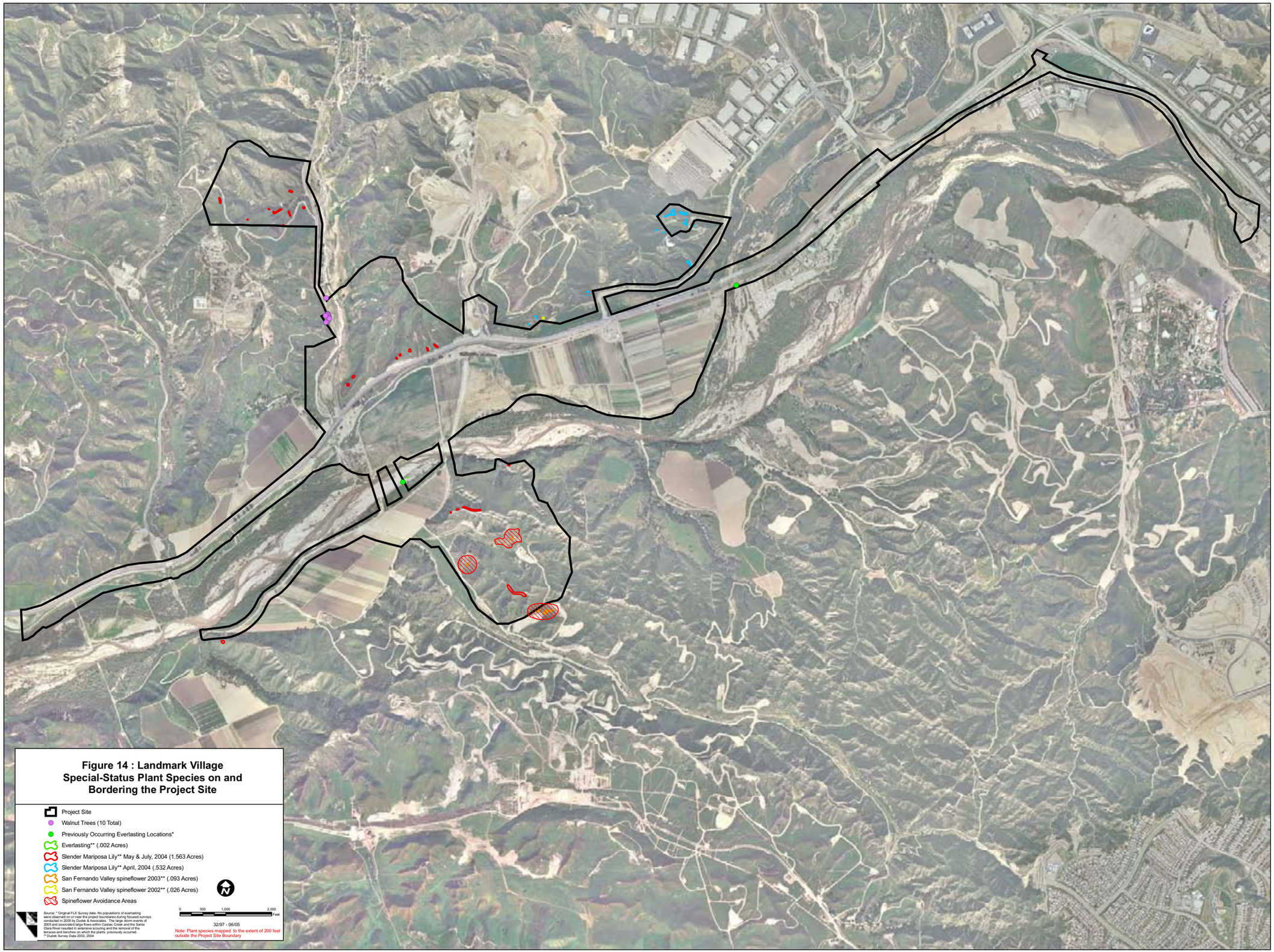

Figure 14 : Landmark Village Special-Status Plant Species on and Bordering the Project Site

On June 7, 2005, Dudek & Associates and County biologists observed five everlasting seedlings on a bench within Castaic Creek within the Valencia Commerce Center north of SR-126, and on a bench within the Creek south of SR-126, outside of the project footprint but within the project study area.

Plants of this undescribed everlasting were previously ascribed to the species *Gnaphalium leucocephalum*, which is now believed not to occur west of the Peninsular and Transverse Ranges in California. It appears that the western California specimens identified as *Gnaphalium leucocephalum* are actually this undescribed taxon. Based on a review of three herbaria (UC Riverside, Rancho Santa Ana Botanic Garden and San Diego Natural History Museum), 14 collections of this plant have been made in Ventura, Orange, Riverside, Los Angeles, and San Diego counties. The *Gnaphalium* plants on the Newhall Ranch Specific Plan site differ from *Gnaphalium leucocephalum* in stature, pubescence, and phyllary characters. The western California *Gnaphalium* plants have been collected relatively few times most collections are old. Of the 14 collections, eight date from 1901 to 1987 (1901, 1918, 1922, 1928, 1931, 1959, 1985 and 1987). There are six more recent collections dating from 1994 to 2003 (1994, two from 1995, 1997 and two from 2003). Many are from somewhat vague localities, such as "San Fernando Valley" and "Pasadena," but which are in areas that have now been substantially urbanized. Modern collections, outside of the Castaic Mesas and Santa Clara River plants, have come mostly from the Santa Ana Mountains region and especially Temescal Wash, in western Riverside County with several collections from adjacent San Diego County. The western California plants are almost always associated with alluvial soils, often being found on the benches along major washes.

San Fernando Valley spineflower is a federal candidate plant species, is state listed as Endangered and is a CNPS List 1B species. This species has been observed in five general areas within the Newhall Ranch Specific Plan area, including Airport Mesa, Grapevine Mesa, Long Canyon, Potrero Canyon and San Martinez Grande Canyon. A total of 275 polygons were mapped during the 2004 growing season, and included an estimated 478,184 individuals. Most of the plants were found on slopes with a south-facing component in habitat that was characterized as open California sagebrush, California buckwheat, ecotonal California sagebrush/California buckwheat and California annual grassland series, or at the edge of agricultural fields on mesas. This species has not been documented on the tract map site or other areas where grading would occur. However, several of the populations in Long Canyon occur in proximity to the project site's disturbance boundary. Specifically, populations occur to the south of the project site at distances between 100 feet and 340 feet. Populations of this species also occur approximately 100 feet west of the borrow site's disturbance boundary, and at a location enclosed by the borrow site (but that maintains an approximately 100-foot buffer from areas that would be disturbed).

9.1.2 Special-Status Plant Species Known to Occur in the Project Area but Not Observed on or Adjacent to the Project Site

The special-status plant species identified in **Table 6** are known to occur in the project area and were target species of the focused plant surveys conducted on, and in the vicinity of, the project site. None of these species were observed on or adjacent to the project site. Given the thoroughness of the survey efforts (**Table 5**), it is unlikely that any of the species identified below are present on the project site, though the potential of some of these species to occur on the site in future seasons cannot be entirely ruled out.

Table 6
Special-Status Plant Species Documented in the Project Area but Not Observed on or Adjacent to the Project Site

Common Name *Scientific Name*	Sensitivity Status			Habitat	Growth Form (Blooming)
	Federal	State	CNPS		
Marsh sandwort *Arenaria paludicola*	FE	CE	1B	Bogs and fens, marshes and swamps (freshwater).	PH (May–August)
Braunton's milk-vetch *Astragalus brauntonii*	FE	--	1B	Closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland/recently burned or disturbed areas, carbonate soils.	PH-b (March–July)
Coulter's saltbrush *Atriplex coulteri*	--	--	1B	Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland/alkaline or clay.	PH (March–October)
Davidson's saltscale *Atriplex serenana* var. *davidsonii*	--	--	1B	Coastal bluff scrub, coastal scrub/alkaline.	AH (April–October)
Malibu baccharis *Baccharis malibuensis*	--	--	1B	Chaparral, cismontane woodland, coastal scrub.	Sh-d (August)
Nevin's barberry *Berberis nevinii*	FE	CE	1B	Chaparral, coastal scrub, cismontane woodland, riparian scrub.	Sh-e (March–April)
Thread-leaved brodiaea *Brodiaea filifolia*	--	--	1B	Chaparral (openings), cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools/often associated with clay soils.	PH-b (March–June)
Plummer's mariposa lily *Calochortus plummerae*	--	--	1B	Chaparral, cismontane woodland, coastal scrub, lower coniferous forests, grasslands, valley granitic soils.	PH-b (May–July)
Late-flowering mariposa lily *Calochortus weedii* var. *vestus*	--	--	1B	Chaparral, cismontane woodland, riparian woodland/often associated with serpentinite soils.	PH-b (May–July)
Southern tarplant *Centromadia parryi* ssp. *Australis*	--	--	1B	Chaparral, coastal scrub, sandstone rocky outcrops.	Sh-d (July–November)
Island mountain-mahogony *Cercoparpus betuloides* var. *blancheae*	--	--	--	Closed-cone coniferous forest, chaparral.	Sh-e (February–May)
Santa Susana tarplant *Deinandra minthornii*	--	CR	1B	Chaparral, coastal scrub; sandstone rocky outcrops.	Sh-d (July–November)

Common Name *Scientific Name*	Sensitivity Status			Habitat	Growth Form (Blooming)
	Federal	State	CNPS		
Slender-horned spineflower *Dodecahema leptoceras*	FE	CE	1B	Chaparral, coastal scrub (alluvial fan), cismontane woodland, sandy soils.	AH (April–June)
Blochman's dudleya *Dudleya blochmaniae* ssp. *Blochmaniae*	--	--	1B	Coastal bluff scrub, coastal scrub, rocky, often associated with clay or serpentinite soils.	PH (April–June)
Marcescent dudleya *Dudleya cymosa* ssp. *marcescens*	FT	CR	1B	Chaparral, volcanic.	PH (April–June)
Santa Monica Mountains dudleya *Dudleya cymosa* ssp. *ovatifolia*	FT	--	1B	Chaparral, coastal scrub/volcanic.	PH (March–June)
Many-stemmed dudleya *Dudleya multicaulis*	--	--	1B	Chaparral, coastal scrub, grasslands, often associated with clay soils.	PH (May–July)
Conejo dudleya *Dudleya parva*	FT	--	1B	Chaparral, coastal scrub, often associated with clay soils.	PH (May–July)
Palmer's grappling hook *Harpagonella palmeri* var. *palmeri*	--	--	4	Chaparral, coastal scrub, valley and foothill grasslands.	AH (March–April)
Round-leaved filaree *Erodium macrophyllum*	--	--	2	Cismontane woodland, valley and foothill grassland, clay soils.	AH (March–May)
Los Angeles sunflower *Helianthus nuttallii* ssp. *Parishii*	--	--	1A	Coastal salt, freshwater marshes and swamps.	PH
Mesa horkelia *Horkelia cuneata* var. *puberula*	--	--	1B	Chaparral, cismontane woodland, coastal scrub/sandy or gravelly.	PH (February–September)
Southwestern spiny rush *Juncus acutus* sp. *leopoldii*	--	--	4	Coastal dunes (mesic), meadows and seeps (alkaline seeps), marshes and swamps (coastal salt).	PH (May–June)
Davidson's bush mallow *Malacothamnus davidsonii*	--	--	1B	Chaparral, cismontane woodland, coastal sage scrub, riparian woodland.	Sh-d (June–January)
California Muhly *Muhlenbergia californica*	--	--	4	Chaparral, coastal scrub, lower mountain coniferous forest, meadows and seeps/mesic, seeps and streambanks.	PH-r (July–September)
Mud nama *Nama strenocarpum*	--	--	2	Marshes and swamps (lake margins, river banks).	A/PH (January–July)
Spreading navarretia *Navarretia fossalis*	FT	--	1B	Chenopod scrub, marshes and swamps, playas, vernal pools.	AH (April–June)
Chaparral nolina *Nolina cismontana*	--	--	1B	Chaparral, coastal scrub, sandstone gabbro soils.	SH-e (April–June)
Short-joint beavertail cactus *Opuntia basilaris* var. *brachyclada*	--	--	1B	Chaparral, Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodland.	Sh-ss (April–June)

Common Name *Scientific Name*	Sensitivity Status			Habitat	Growth Form (Blooming)
	Federal	State	CNPS		
California Orcutt grass *Orcuttia californica*	FE	CE	1B	Vernal pools.	AH (April–August)
Lyon's pentachaeta *Pentachaeta lyonii*	FE	CE	1B	Chaparral, coastal scrub, valley and foothill grassland, volcanic endemic soils.	AH (March–August)
Pringle's yampah *Perideridia pringlei*	--	--	4	Chaparral, cismontane woodland, coastal scrub, pinyon and juniper woodlands, serpentinite, clay soils.	PH (April–August)
Gambel's watercress *Rorippa gambelii*	FE	CT	1B	Marshes and swamps (freshwater or brackish).	PH-r (April–September)
Rayless ragwort *Senecio aphanactis*	--	--	2	Cismontane woodland, coastal scrub/alkaline.	AH (January–April)
Salt spring checkerbloom *Sidalcea neomexicana*	--	--	2	Chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, playas/alkaline, mesic	PH (March–June)
Sonoran maiden fern *Thelypteris puberula* var. *sonorensis*	--	--	2	Meadows and seeps (seeps and streams).	PH-r (January–September)

Key:
Status:
Federal: FE = Federal Endangered; FC = Federal Candidate

State: CE = California Endangered; CT = California Threatened; CR = California Rare

CNPS: List 1A = Presumed extinct
List 1B = Plants Rare and Endangered in California and elsewhere
List 2 = Plants Rare, Threatened, or Endangered in California, but more common elsewhere
List 4 = Plants of limited distribution (watch list)

Growth Form:

AH =	Annual Herb	Sh = Shrub	r = rhizommatous
PH =	Perennial Herb	b = bulb	e = evergreen
		d = deciduous	ss = stem succulent

9.1.3 Oaks

The County of Los Angeles Oak Tree Ordinance (CLATO), Sections 22.56.2050-22.56.2260, protects oak trees that are at least 8 inches in diameter, as well as trees that have two trunks totaling at least 12 inches in diameter, as measured 4.5 feet above natural ground. A heritage oak, as defined by CLATO, is any species in the genus *Quercus* that measures 36 inches or more in diameter as measured 4.5 feet above natural ground, or any oak of 36 inches or less in diameter having a significant historical or cultural importance to the community. CLATO requires that all potential impacts to oak trees regulated by this ordinance be preceded by an application to the County that includes a detailed oak tree report. Mitigation for impacts to oak trees is usually required as a condition of an Oak Tree Permit issued by the County.

In addition, Senate Bill 1334, Kuehl, Oak Woodlands Conservations, contains the following three elements: (A) counties must determine whether a project may result in the conversion of oak woodlands ("oak" is defined as 5 inches or more in diameter at breast height); (B) if so, the county must determine if the conversion will have a significant impact on the environment; and (C) if there is a conversion, and it has a significant impact, the county must impose one or more of the following mitigation measures:

(1) Conserve oak woodlands, through the use of conservation easements.

(2) Plant an appropriate number of trees, including maintaining plantings and replacing dead trees.

   (A) Maintain planted oak trees for seven years.

   (B) The planting of oak trees shall not fulfill more than one-half of the mitigation requirement for the project.

(3) Contribute funds to the Oak Woodlands Conservation fund.

(4) Other mitigation measures developed by the County.

An oak tree survey was conducted of the on-site oak woodlands (see **Figure 11A**) occurring within 200 feet of the proposed grading limits. The survey estimated 140 oaks potentially regulated by CLATO and Senate Bill 1334. The vast majority of the oaks on the site are coast live oak, but valley oak (*Quercus lobata*) also occurs (approximately four valley oak trees). Of the estimated 140 oaks, 15 are estimated to be heritage oaks as defined by CLATO.

9.1.4 Sensitive Plant Communities

CDFG Wildlife and Habitat Data Analysis Branch has developed a *List of California Terrestrial Natural Communities*. The most recent version of this list, dated September 2003, is derived from the CNDDB and is intended to supersede all other lists developed from the CNDDB. It is based on the detailed classification put forth in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). It is also structured to be compatible with previous CNDDB lists (e.g., Holland 1986).

The primary purpose of the CNDDB classification is to assist in the characterization and rarity of various vegetation types. For the purposes of this Biota Report, plant communities denoted on the list as "high priority for inventory in CNDDB" in the September 2003 version, or that are otherwise regulated by local, state, and/or federal resource agencies, are considered of "special status."

Of the 14 plant communities occurring on the Landmark Village project site, southern willow scrub, southern cottonwood willow riparian forest, valley freshwater marsh, and scalebroom scrub are currently

considered of "high priority" and, therefore, are considered of special-status. Please see **Section 6.1**, above, for a more detailed discussion of these plant communities and their distribution on the project site.

It should be noted that the Newhall Ranch Program EIR, Section 4.6, Biota, and the associated Biota Report, dated July 1996, identified coastal sage scrub and elderberry scrub as sensitive plant communities. The identification of these two plant communities as sensitive was based on a previous CDFG list of terrestrial natural communities, which has been superseded by the current *List of California Terrestrial Natural Communities*, dated September 2003. Consequently, these two communities, as labeled, are not considered of special status in this Biota Report.

9.2 SPECIAL-STATUS WILDLIFE

Special-status wildlife species include those that are state or federally listed as Threatened or Endangered, proposed for listing as Threatened or Endangered, designated as state or federal candidates for listing, considered state Species of Special Concern, or that are considered a state Fully Protected Animal.

Based on a review of the CNDDB and the biological documentation prepared for the project site and the greater Newhall Ranch Specific Plan area, a total of 49 special-status wildlife species were identified that are known to occur in the project region. This list formed the basis of the following analysis, wherein each of the identified species is addressed in one of the following three sections: **Section 9.2.1** addresses the special-status wildlife species that were observed on or adjacent to the project site during the course of various field surveys; **Section 9.2.2** addresses the special-status wildlife species that have not been observed on the site, but based on the presence of suitable habitat and known occurrences in the area, have the potential to occur on the site as a resident, overwintering or nesting species, and **Section 9.2.3** addresses the special-status wildlife species known to occur in the project area, but for which the project site does not provide suitable habitat to support the species as a resident or nesting species.

9.2.1 Special-Status Wildlife Species Observed on the Project Site

During the course of various field surveys conducted for the proposed project or greater Newhall Ranch Specific Plan area (**Table 5**), 16 special-status wildlife species were observed on or bordering the project site. **Table 7** identifies these species and provides the species' listing status, habitat requirements and observation information.

Table 7
Special-Status Wildlife Species Observed on or Adjacent to the Project Site

Common Name *Scientific Name*	Status		Habitat Requirements	On-Site Status
	Federal	State		
FISH				
Santa Ana sucker *Catastomus santaanae*	--	CSC	Occupies small-to medium-sized perennial streams with water ranging in depth from a few centimeters to a meter or more.	This species is known to occur in the Santa Clara River and has been observed during focused fish surveys (CNDDB, Impact Sciences 2002); and it is expected to occur in the portion of the river bordering the project site. Population in the Santa Clara River system is not considered to be of Threatened status because it is introduced to the area.
Unarmored threespine stickleback *Gasterosteus aculeatus williamsoni*	FE	CE, CFP	Slow-moving and backwater areas.	This species is known to occur in the Santa Clara River and has been observed in the portion of the river bordering the Landmark Village tract map site (ENTRIX 2005).
Arroyo chub *Gila orcutti*	--	CSC	Slow-moving or backwater sections of warm to cool streams with mud or sand substrates.	This species is known to occur in the Santa Clara River and has been observed in the portion of the river bordering the Landmark Village tract map site (ENTRIX 2005).
REPTILES				
Silvery legless lizard *Anniella pulchra pulchra*	--	CSC	Stabilized dunes, beaches, dry washes, chaparral, pine, oak, and riparian woodlands; associated with sparse vegetation and sandy or loose, loamy soils.	This species has been observed on the project site in Chiquito Canyon (Impact Sciences 2004); suitable habitat occurs on the project site in association with coastal sage scrub, chaparral, oak woodland, and riverbank habitats.
Southwestern pond turtle *Clemmys marmorata pallida*	--	CSC	Streams, ponds, freshwater marshes and lakes with growth of aquatic vegetation.	This species was observed in the reach of the Santa Clara River bordering the project site (Compliance Biology 2004); river and riparian habitats on and bordering the project site provide suitable habitat.
Two-striped garter snake *Thamnophis hammondii*	--	CSC	Perennial and intermittent streams with rocky or sandy beds and artificially-created aquatic habitats (man-made lakes and stock ponds); requires dense riparian vegetation.	This species was observed in the reach of the Santa Clara River bordering the project site (Compliance Biology 2004); river and riparian habitats on and bordering the project site provide suitable habitat.

Common Name *Scientific Name*	Status Federal	 State	Habitat Requirements	On-Site Status
BIRDS				
Cooper's hawk (nesting) *Accipiter cooperi*	--	CSC	Dense stands of live oak, riparian woodlands or other woodland habitats near water.	This species was observed adjacent to the Santa Clara River on the Landmark Village site (Guthrie 2004); the site provides foraging and nesting habitat for the species.
Southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	--	CSC	Coastal sage scrub.	This species was observed to be a fairly common resident at the off-site grading sites (Guthrie 2004); suitable nesting and foraging habitat is present at these locations.
Lawrence's goldfinch *Carduelis lawrencei*	BCC	--	Valley foothill hardwood, valley foothill hardwood-conifer; and, in S. CA., desert riparian, palm oasis, pinyon-juniper and lower montane habitats.	Observed within the riparian habitats on the site during bird surveys (Guthrie 2004); suitable nesting and foraging habitat present on site.
Northern harrier (nesting) *Circus cyaneus*	--	CSC	Coastal salt marsh, freshwater marsh, grasslands and agricultural fields.	This species has been observed foraging on the site (Impact Sciences 2004); suitable foraging and nesting habitat is present on site.
Yellow warbler (nesting) *Dendroica petechia brewsteri*	--	CSC	Riparian thickets and woodlands.	Observed on several occasions during the 2004 bird surveys; likely nests in the riparian areas on the site (Guthrie 2004).
White-tailed kite (nesting) *Elanus leucurus*	--	CFP	Inhabits herbaceous and open stages of most habitats, common in cismontane in California. Nests are placed near top of dense oak, willow or other tree stand; usually 6-20 m (20-100 ft) above ground. Nest located near open foraging area.	Species was observed on the site adjacent to the Santa Clara River during surveys in 2004 (Guthrie 2004); the site provides foraging and nesting habitat for the species.
California horned lark *Eremophila alpestris actia*	--	CSC	Grasslands, disturbed areas, agriculture fields and beach areas.	This species has been observed foraging on the site (Impact Sciences 2004); suitable nesting and foraging habitat is present on site.
Yellow-breasted chat (nesting) *Icteria virens*	--	CSC	Riparian thickets and riparian woodlands with a dense understory.	Observed on several occasions during the 2004 bird surveys; likely nests in the riparian areas on the site (Guthrie 2004).
Least Bell's vireo (nesting) *Vireo bellii pusillus*	FE	CE	Riparian vegetation with extensive willows below 2,000 ft.	No individuals have been observed nesting within the project boundaries, but individuals have been observed nesting a short distance to the west and east of the project site (Guthrie 2004); suitable nesting habitat is present on the project site.

Common Name *Scientific Name*	Status Federal	State	Habitat Requirements	On-Site Status
MAMMALS				
Pallid bat *Antrozous pallidus*	--	CSC	Arid habitats, including grasslands, shrublands, woodlands and forests; prefers rocky outcrops, cliffs and crevices with access to open habitats for foraging.	This species was detected on the project site during ANABAT surveys (Impact Sciences 2004); the project site lacks the preferred roosting habitat of this species, but does provide suitable foraging habitat.
San Diego desert woodrat *Neotoma lepida intermedia*	--	CSC	Chaparral, coastal sage scrub and the understory of tree thickets.	A species of desert woodrat was observed on both off-site grading locations during 2004 surveys (Impact Sciences 2004); it is assumed that the animals observed were the San Diego (*intermedia*) subspecies.

STATUS KEY:

Federal:
FE: Federally Endangered
BCC: Bird of Conservation Concern

State:
CE: California Endangered
CFP: California Fully Protected
CSC: California Species of Special Concern

9.2.2 Special-Status Wildlife Species With Potential to Occur on the Project Site

Twenty-three special-status wildlife species have been identified as having the potential to occur on the site, based on the presence of suitable habitat and known occurrences in the area, despite the fact that they have not been observed during general or focused surveys of the project site. **Table 8** identifies these species and provides the species' listing status, habitat requirements and an explanation of why the species has the potential to occur on the site as a resident, overwintering, nesting or roosting species.

Table 8
Special-Status Wildlife Species with Potential to Occur on the Project Site

Common Name *Scientific Name*	Status Federal	State	Habitat Requirements	Habitat Suitability
INVERTEBRATES				
Insecta Order Lepidoptera (butterflies and moths)				
Monarch butterfly *Danaus plexippus*	--	**	Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, Monterey cypress), with nectar and water sources nearby.	The eucalyptus trees on the site provide potential winter roosting habitat, but are considered of limited roosting value as they occur within an agricultural field and are not wind protected; no winter roosts have been observed on the site.

Common Name *Scientific Name*	Status Federal	 State	Habitat Requirements	Habitat Suitability
AMPHIBIANS				
Arroyo toad *Bufo californicus*	FE	CSC	Restricted to rivers with shallow, gravely pools adjacent to sandy terraces that have a nearly complete closure of cottonwoods, oaks or willows, and almost no herbaceous cover. Requires shallow pools with minimal current, little to no emergent vegetation and a sand or pea gravel substrate overlain with flocculent silt for egg deposition.	Based on the result of protocol surveys, it appears that arroyo toads are not breeding or otherwise utilizing habitats on or adjacent to the project site (Compliance Biology 2004). Given the presence of some suitable habitat and that this species has been recorded in low numbers upstream of the project site, the species could occupy habitats on or bordering the site.
Western spadefoot *Scaphiopus hammondii*	--	CSC	Open areas in lowland grasslands, chaparral and pine-oak woodlands; requires temporary rain pools that last approximately three weeks and lack exotic predators.	Seasonal backwater areas associated with the drainages on and bordering the site, as well as depressions within existing dirt roads, provide breeding habitat; no spadefoot were observed in these areas during appropriately timed surveys (Compliance Biology 2004). Given documented occurrences of the species in the project area, and the presence of some suitable breeding habitat, the species could occupy habitats on the site.
REPTILES				
Coastal western whiptail *Aspidoscelis tigris stejnegeri*	--	***	Open areas in semiarid grasslands, scrublands and woodlands.	Suitable habitat occurs on site in association with grassland, scrub, oak woodland and riverbank habitats; species is known to occur in the project region.
Rosy boa *Charina trivirgata*	--	***	Inhabits desert and chaparral habitats with rocky soils in coastal canyons and hillsides, desert canyons, washes and mountains.	Suitable habitat occurs on site in association with scrub, chaparral, oak woodland and riverbank habitats; species is known to occur in the project region.
San Bernardino ringneck snake *Diadophis punctatus modestus*	--	***	Inhabits open, relatively rocky areas, often in somewhat moist microhabitats near intermittent streams. Avoids moving through open or barren areas by restricting movements to areas of surface litter or herbaceous vegetation.	Suitable habitat occurs on site in association with oak woodland and riverbank habitats; species is known to occur in the project region.
Coast horned lizard *Phrynosoma coronatum*	--	CSC	Exposed gravelly-sandy soils with minimal shrubs, riparian woodland clearings, dry chamise chaparral and annual grasslands with scattered seepweed or saltbush.	Suitable habitat occurs on site in association with scrub, chaparral and riverbank habitats; species is known to occur in the project region.

Common Name *Scientific Name*	Status Federal	 State	Habitat Requirements	Habitat Suitability
REPTILES (continued)				
Coast patch-nosed snake *Salvadora hexalepis virgultea*	--	CSC	Inhabits brushy or shrubby vegetation. Requires small mammal burrows for refuge and overwintering sites.	Suitable habitat occurs on site in association with shrub habitats.
BIRDS				
Tricolored blackbird (nesting colony) *Agelaius tricolor*	BCC	CSC	Freshwater marshes and riparian scrub.	Suitable nesting and foraging habitat present on and bordering the project site.
Bell's sage sparrow (nesting) *Amphispiza belli belli*	BCC	CSC	Saltbush scrub and chaparral.	Suitable nesting and foraging habitat present.
Long-eared owl (nesting) *Asio otus*	--	CSC	Dense, riparian and live oak thickets near meadow edges, nearby woodland and forest habitats. Also found in dense conifer stands at higher elevations.	Suitable nesting and foraging habitat is present on the project site.
Western burrowing owl (burrow sites) *Athene cunicularia*	BCC	CSC	Grasslands and open scrub, particularly with ground squirrel burrows.	Site provides suitable foraging and nesting habitat for the species; California ground squirrels occur on the project site.
Western yellow-billed cuckoo (nesting) *Coccyzus americanus occidentalis*	FC BCC	CE	Nests along the broad, lower flood-bottoms of larger river systems. Also nests in riparian forests and riparian jungles of willow often mixed with cottonwoods, with an understory of blackberry, nettles or wild grape.	Suitable nesting and foraging habitat occurs on the project site; this species has not been observed nesting on or near the project site during focused surveys; however, one individual (thought to be a migrant) was observed during surveys in the project area (Guthrie 1997).
Southwestern willow flycatcher (nesting) *Empidonax traillii extimus*	FE	--	Riparian woodlands that contain water and low willow thickets.	Suitable nesting and foraging habitat is present on the project site. A single willow flycatcher was observed foraging along the Santa Clara River east of the project site; however given the timing of this observation (May 31), and lacking any subsequent evidence of nesting, the observed willow flycatcher cannot be positively identified as belonging to the southwestern form of willow flycatcher (Guthrie 2004).
Merlin (wintering) *Falco columbarius*	--	CSC	Coastlines, wetlands, woodlands, agricultural fields and grasslands.	Although this species does not nest in California, the CDFG considers wintering birds to be of Special Concern; could occur on the site as a winter migrant.
Loggerhead shrike *Lanius ludovicianus*	--	CSC	Grasslands with scattered shrubs, trees, fences or other perches.	Suitable nesting and foraging habitat present on site.
Summer tanager (nesting) *Piranga rubra*	--	CSC	Cottonwood-willow riparian habitats, especially older, dense stands along rivers and streams.	Suitable nesting and foraging habitat present on and bordering the site.

Common Name *Scientific Name*	Status Federal	State	Habitat Requirements	Habitat Suitability
MAMMALS				
Pale big-eared bat *Corynorhinus townsendii pallescens*	--	CSC	Utilizes a variety of communities, including conifer and oak woodlands and forests, arid grasslands and deserts and high-elevation forests and meadows. Requires appropriate roosting, maternity and hibernacula sites free from human disturbance.	This species was not detected on the project site during ANABAT surveys (Impact Sciences 2004). Suitable roosting and foraging habitat is present on the site.
Western mastiff bat *Eumops perotis californicus*	--	CSC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub and urban.	This species was not detected on the project site during ANABAT surveys (Impact Sciences 2004); suitable roosting and foraging habitat is present on the site.
Mountain lion *Felis concolor browni*	--	CFP	Occurs in a variety of scrub and forested habitats.	This species is known to occur in the project region and has been observed on the Newhall Ranch Specific Plan area (outside of the project site); project site could host transient individuals and be part of a local lion's home range.
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	--	CSC	Chaparral and coastal sage scrub.	Suitable habitat is present within on-site coastal sage scrub and chaparral habitats.
Fringed myotis *Myotis thysanodes*	--	***	Occurs in a wide variety of habitats. Optimal habitats include pinyon-juniper, valley foothill hardwood and hardwood-conifer woodlands. Forms maternity colonies and roosts in caves, mines, buildings and crevices.	This species was not detected on the project site during ANABAT surveys (Impact Sciences 2004); suitable roosting and foraging habitat is present on site.
Yuma myotis *Myotis yumanensis*	--	***	Inhabits open forests and woodlands with sources of water. Species is closely tied to bodies of water, over which it feeds. Forms maternity colonies in caves, mines, buildings or crevices.	This species was not detected on the project site during ANABAT surveys (Impact Sciences 2004); suitable roosting and foraging habitat is present on the site.
American badger *Taxidea taxus*	--	CSC	Drier open stages of shrub, forest and herbaceous habitats with friable soils.	Suitable habitat is present.

STATUS KEY:

Federal
FE: Federally Endangered
FT: Federally Threatened
FC: Federal Candidate for listing as Threatened or Endangered
BCC: Bird of Conservation Concern

State
CE: California Endangered
CT: California Threatened
CFP: California Fully Protected
CSC: California Species of Special Concern
**: Over wintering (or roosting) sites should be protected, butterfly probably not at risk currently
***: Special Animal

9.2.3 Special-Status Wildlife Species Not Expected or Rarely Occurring on the Project Site

The project site lacks suitable habitat to support the species addressed in **Table 9, Special-Status Wildlife Species Not Expected or Rarely Occurring on the Project Site,** as a resident or nesting species. **Table 9** provides the species' regulatory status, habitat requirements and an explanation of why the species is not expected to reside or substantially utilize the project site. As these species are not expected to breed, nest, or otherwise reside on or substantially utilize the project site, they are not discussed further in this document.

Table 9
Special-Status Wildlife Species Not Expected or Rarely Occurring on the Project Site

Common Name *Scientific Name*	**Status**		**Habitat Requirements**	**Habitat Suitability**
	Federal	**State**		
INVERTEBRATES				
Crustacea Order Anostraca (fairy shrimp)				
San Diego fairy shrimp *Branchinecta sandiegoensis*	FE	--	Vernal pools.	No indication of vernal or other seasonal pools were detected during site surveys. Soils present on site are not suitable to support vernal/seasonal pools.
Crustacea Order Anostraca (fairy shrimp) (continued)				
Riverside fairy shrimp *Streptocephalus woottoni*	FE	--	Vernal pools.	No indication of vernal or other seasonal pools were detected during site surveys. Soils present on site are not suitable to support vernal/seasonal pools.
Insecta Order Lepidoptera (butterflies and moths)				
San Emigdio blue butterfly *Plebulina emigdionis*	--	--	Often near streambeds, washes or alkaline areas. Associated with four-wing saltbrush (*Atriplex canescens).*	No individuals or suitable habitat (i.e., stands of four-winged saltbrush) were observed during focused surveys (Compliance Biology 2004).
Quino checkerspot butterfly (Wright's *Euphydryas)* *Euphydryas editha quino*	FE	--	Occurs in localized colonies, always closely associated with the larval foodplant dot-seed plantain *(Plantago erecta)* and clay or cryptobiotic soils.	The main larval food plant does not occur on the site (Compliance Biology 2004). This butterfly was last documented in Los Angeles County in 1954.
FISH				
Steelhead rainbow trout (Southern California ESU) *Oncorhynchus mykiss*	FE	CSC	Clean, clear, cool well-oxygenated streams. Needs relatively deep pools in migration and gravelly substrate in which to spawn.	Known to occur in the Santa Clara River west of Piru Creek, but not documented in the portion of the creek in the project area; not observed during numerous surveys near the project site.

Common Name *Scientific Name*	Status Federal	 State	Habitat Requirements	Habitat Suitability
AMPHIBIANS				
California red-legged frog *Rana aurora draytonii*	FT	CSC	Permanent water sources such as ponds, lakes, reservoirs, streams and adjacent riparian woodlands.	Field investigations indicate that potential breeding or summer habitat is absent from the portion of the Santa Clara River bordering the project site (ENTRIX 2005); generally avoids large river channels with widely fluctuating flows because such habitat does not permit successful reproductive activity (Hays and Jennings 1989). Not documented in the Santa Clara River (CNDDB), but documented within the Piru Creek and San Francisquito Creek tributaries to the river.
BIRDS				
Sharp-shinned hawk (nesting) *Accipiter striatus*	--	CSC	Nests in woodlands and forages over dense chaparral and scrublands.	The project area is outside the known breeding range for this species. However, because this species forages in woodlands, chaparral, scrublands and edge/ecotone areas between habitats, it could occasionally forage at the site during winter months or during migration periods.
Great egret (rookery) *Ardea alba*	--	***	Nests colonially in large trees. Rookery sites are typically located near marshes, tide-flats, irrigated pastures and margins of rivers and lakes.	No rookery sites have been observed on or near the project site during annual bird surveys.
Great blue heron (rookery) *Ardea herodias*	--	***	Nests colonially in tall trees, cliffsides and sequestered spots on marshes. Rookery sites are usually in close proximity to foraging areas such as marshes, lake margins, tide-flats, wet meadows, rivers and streams.	No rookery sites have been observed on or near the project site during annual bird surveys.
Ferruginous hawk (wintering) *Buteo regalis*	--	CSC	Grasslands, agricultural fields and open scrublands.	This species is an infrequent seasonal migrant. Although suitable foraging habitat is present on the site, this species does not nest in California and is only expected to rarely forage or otherwise occur on the site.

Common Name *Scientific Name*	Status Federal	 State	Habitat Requirements	Habitat Suitability
BIRDS (continued)				
Prairie falcon (nesting) *Falco mexicanus*	--	CSC	Grasslands, savannas, rangeland, agricultural fields and desert scrub; requires sheltered cliff faces for shelter and nesting.	No suitable nesting habitat on or bordering the project site. Could forage on the site.
Least bittern (nesting) *Ixobrychus exilis*	--	CSC	Dense emergent wetlands of cattails and tules are essential.	Cattails and tules occur within the Santa Clara River corridor; however, these areas do not contain the dense emergent vegetation characteristic of nesting habitat of this species.
Bank swallow (nesting) *Riparia riparia*	--	CT	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes or the ocean to dig a nesting hole.	No suitable nesting habitat on or bordering the project site and no recent records of nesting in the area.
MAMMALS				
Spotted bat *Euderma maculata*	--	CSC	Occupies a wide variety of habitats from arid deserts and grasslands, to mixed conifer forests. Feeds over water and along washes. Needs rock crevices in cliffs or caves for roosting.	This species was not detected on the project site during ANABAT surveys conducted in 2004 (Impact Sciences 2004). No suitable roosting habitat on or bordering the project site. Only rare to occasional spotted bat sightings have been recorded in the project vicinity.
Southern grasshopper mouse *Onychomys torridus ramona*	--	CSC	Inhabits desert areas, especially scrub habitats with friable soils for digging. Prefers low to moderate shrub cover.	This species has not been detected on the project site or the greater Newhall Ranch Specific Plan area during small mammal trapping (Impact Sciences 2004).
Los Angeles pocket mouse *Perognathus longimembris brevinasus*	--	CSC	Inhabits lower elevation grasslands and coastal sage communities on open ground with fine sandy soils. May not dig extensive burrows, hiding instead under weeds and dead leaves.	This species has not been detected on the project site or the greater Newhall Ranch Specific Plan area during small mammal trapping (Impact Sciences 2004).

STATUS KEY:

Federal
FE: Federally Endangered
FT: Federally Threatened

State
CT: California Threatened
CFP: California Fully Protected
CSC: California Species of Special Concern
***: Special Animal

9.3 JURISDICTIONAL WETLANDS AND DRAINAGES

Wetlands, creeks, streams and permanent and intermittent drainages are generally subject to the jurisdiction of the ACOE under Section 404 of the Federal Clean Water Act. By ACOE definition, all aquatic or riverine habitats between the water's edge and the "ordinary high water mark" of rivers, creeks and streams are considered "waters of the U.S." and may fall under ACOE jurisdiction. If adjacent wetlands occur, the limits of jurisdiction extend beyond the ordinary high water mark to the outer edge of the wetlands. Wetlands are defined by ACOE as "those areas that are inundated or saturated by surface or groundwater at a frequency or duration to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." (ACOE 1987) The presence and extent of wetland areas are normally determined by examination of the vegetation, soils and hydrology of a site. The ACOE definition of wetlands requires that all three wetland identification parameters be met.

Streambeds within the project site are subject to regulation by CDFG under Section 1602 of the California Fish and Game Code. A stream is defined under these regulations as a body of water that flows at least periodically or intermittently through a bed or channel having banks, and that supports fish or other aquatic life.

9.3.1 ACOE Jurisdiction

The tract map site is generally bordered to the east by Castaic Creek, to the south by the Santa Clara River and to the west by Chiquito Canyon Creek. As shown in **Figure 15, Jurisdictional Resources**, portions of Chiquito Canyon Creek and the Santa Clara River are within the project boundaries, as well as portions of Castaic Creek. A jurisdictional delineation of "waters of the U.S." (including tributaries) associated with the Santa Clara River and Chiquito Canyon Creek within the Specific Plan was conducted by URS in 2003 in accordance with ACOE protocol. Castaic Creek was not delineated at that time. All of these drainages are considered to be under ACOE jurisdiction. Additionally, the following features on the project site have also been determined to be under the jurisdiction of the ACOE: portions of four seasonal tributaries of the Santa Clara River, two seasonal tributaries of Chiquito Canyon Creek, and two agricultural drains. The delineation conducted by URS indicated a total of 13.19 acres on the project site under the jurisdiction of the ACOE. Based on an interpretation of an aerial photograph of the site, it is estimated that approximately 3.84 acres of Castaic Creek occur within the project boundary, just north and south of SR-126, which is also expected to be under ACOE jurisdiction, for a total estimated 17.03 acres of ACOE jurisdiction within the project site boundary. There are no other features within the proposed project boundaries that are under the jurisdiction of the ACOE.

9.3.2 CDFG Jurisdiction

The jurisdictional delineation conducted by URS (2003) also identified areas under the jurisdiction of CDFG (see **Figure 15**). CDFG jurisdiction on the project site encompasses the 17.03 acres under ACOE jurisdiction (as discussed above), but because CDFG also takes jurisdiction over all riparian vegetation associated with creeks, drainages, and rivers, there is an additional 44.43 acres of riparian vegetation on the site under CDFG jurisdiction. The Landmark Village applicant is seeking approval of a Master 404 Permit from the ACOE and a Master 1600 Agreement from the CDFG for the Newhall Ranch Specific Plan area, including the Landmark Village site. The environmental document is in process at this time and a draft of the EIR/EIS is expected to be released for public review late 2005.

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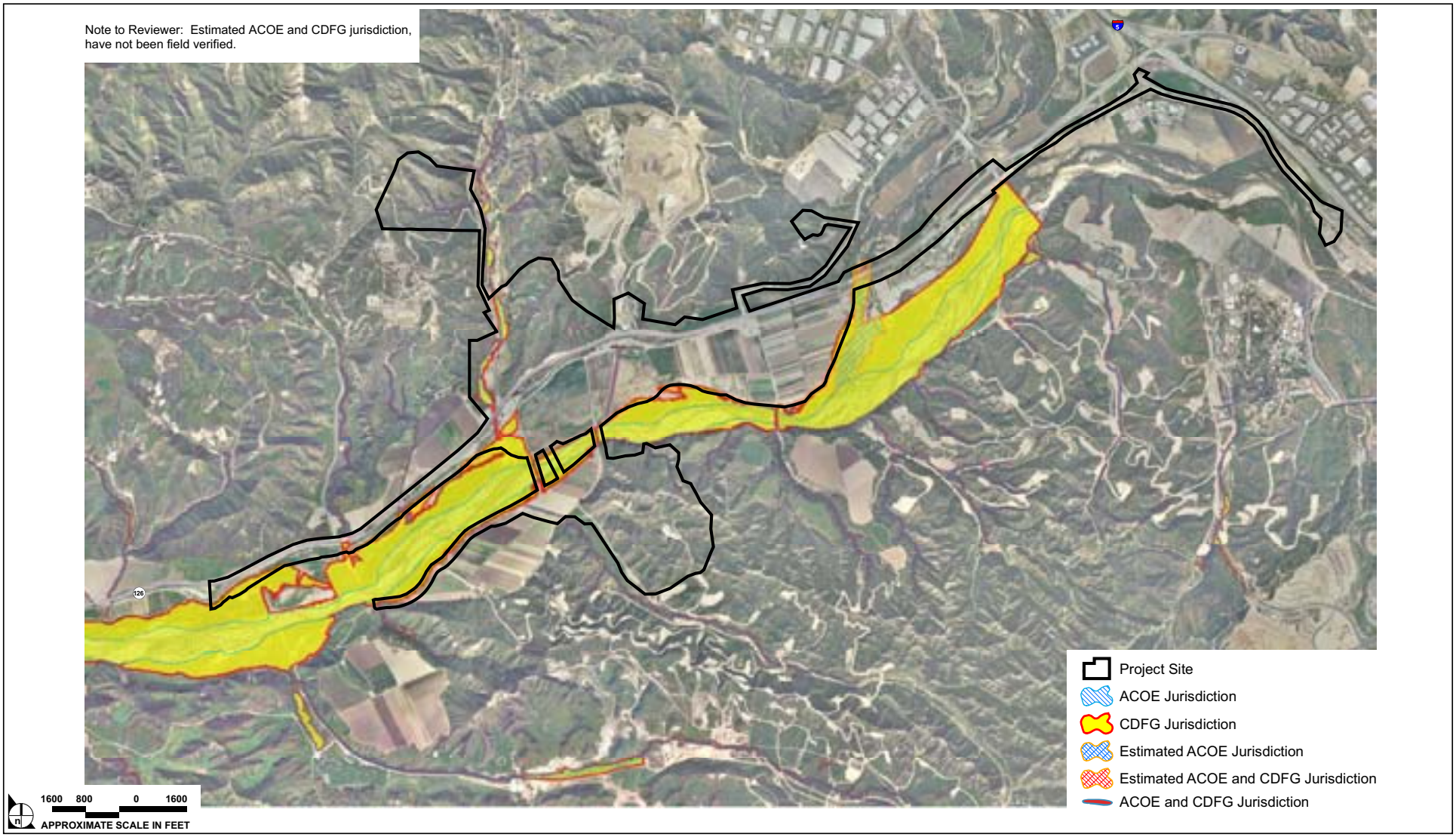


SOURCE: Impact Sciences, Inc. – July 2005, URS – 2004

FIGURE **15**

10.0 OVERALL BIOLOGICAL VALUE OF PROPERTY

A total of 373.6 acres is actively used for agricultural purposes. This area is disked regularly and has little continuous vegetative cover; however, it provides foraging habitat for raptors and other bird species. The Long Canyon borrow site and the reclaimed water tank site contain large expanses (approximately 146.55 and 69.75 acres, respectively) of coastal sage scrub and/or coastal sage chaparral scrub habitat. These areas provide suitable habitat for numerous wildlife species (including nesting special-status birds and special-status reptiles). The Chiquito Canyon grading site is in a more disturbed condition and contains a more fragmented and smaller quantity (57.85 acres) of coastal sage scrub habitat.

The riparian habitats on the Landmark Village site are considered of high biological value. The riparian forest and riparian scrub communities on the project site provide suitable habitat for numerous common and special-status wildlife species, as discussed above (**Tables 7** and **8**). The portion of the Santa Clara River on and bordering the project site is an important migration and genetic dispersion corridor for many wildlife species, including aquatic taxa, riparian obligate species (resident and migratory) and larger, more mobile terrestrial animals. Additionally, Chiquito Canyon borders the project site to the west and the Castaic Creek drainage borders the site to the east. Both of these drainages are tributaries of the Santa Clara River and serve as suitable habitat/movement corridors for wildlife route from the river to the north towards the Angeles and Los Padres National Forests.

Constraints to development posed by these resources include the following:

- Significant impacts as defined by CEQA and SEATAC would occur with respect to the loss of mulefat scrub, coast live oak woodland, coastal sage scrub, elderberry scrub, southern willow scrub, southern cottonwood willow riparian forest, scalebroom scrub, valley freshwater marsh, wildlife habitat, special-status bird nests, special-status plant species, protected oaks, special-status wildlife species, and CDFG and ACOE jurisdictional resources. Mitigation will be required to avoid, reduce, or compensate impacts on these resources.
- Significant indirect impacts would occur with respect to increased light and glare, increased non-native plant species and increased human and domestic animal presence.
- The loss or destruction of active bird nests, including eggs, young, and/or adult birds would be considered a violation of the Migratory Bird Treaty Act and the California Fish and Game Code.
- Impacts and/or fill of streambeds, drainages, and associated riparian/wetland vegetation under the jurisdiction of the CDFG and/or ACOE would require appropriate permits from these agencies.
- The loss of or damage to oak trees under the jurisdiction of the CLATO would require a permit from the County.
- Unavoidable significant impacts would occur with respect to the loss of many sensitive animal species, loss of coastal sage scrub, the overall loss of wildlife habitat and increased human and domestic animal presence. The project would also contribute to an unavoidable significant cumulative impact related to the ongoing loss of biological resources in the project region.

11.0 IMPACT ASSESSMENT

This section identifies the applicable significance criteria from CEQA that is used in this report. It also focuses on the assessment of the direct, indirect and cumulative impacts associated with implementation of the Landmark Village project. Applicable mitigation measures from the RMP of the Newhall Ranch Specific Plan and the Newhall Ranch Program EIR (May 2003) are also identified.

11.1 SIGNIFICANCE THRESHOLD CRITERIA

Significant impacts of proposed development on the project site were determined from criteria included in the *CEQA Guidelines* (14 Cal.Code Regs. §§15000, et seq.). As stated in Appendix G (Environmental Checklist) of the *CEQA Guidelines* (2005), a project could have a significant impact on the environment if it would

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFG or USFWS;
- have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Section 15065(a) of the *CEQA Guidelines* also states that a project may have a significant effect on the environment when the project has the potential to

- substantially degrade the quality of the environment;
- substantially reduce the habitat of a fish or wildlife species;
- cause a fish or wildlife population to drop below self-sustaining levels;
- threaten to eliminate a plant or animal community; or
- substantially reduce the number or restrict the range of an Endangered, Rare or Threatened species.

11.1.1 Impact Assessment Approach and Methodology

Direct impacts typically represent the physical alteration (i.e., habitat degradation or loss) of biological resources that occur on site as a result of project implementation. Indirect impacts are those reasonably foreseeable effects caused by project implementation on remaining or adjacent biological resources. However, physical alteration of habitat is not in and of itself a "significant" impact under CEQA; rather, significance is determined when the physical alteration of habitat is evaluated in terms of each of the significance threshold criteria defined above. For example, if habitat alteration results in a direct or indirect loss or causes an otherwise substantial adverse effect on a species identified as a "candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the CDFG or USFWS," impacts would be considered significant, assuming appropriate compensatory or other mitigation is not available or feasible.

An evaluation of whether an impact on biological resources would be "substantial," and, therefore, a significant impact, must consider both the resource itself and the significance threshold criteria being evaluated. For example, because most plant and animal species are dependent on native habitats to satisfy various life cycle requirements, a habitat-based approach that addresses the overall biological value of a particular vegetation community or habitat area is appropriate when determining whether or not alteration of that habitat will "substantially" affect special-status species, sensitive habitats, wetlands or movement corridors. The relative biological value of a particular habitat area—its functions and values—can be determined by such factors as disturbance history, biological diversity, its importance to particular plant and wildlife species, its uniqueness or sensitivity status, the surrounding environment and the presence or absence of special-status resources.

However, direct impacts to specific plant and wildlife resources (e.g., active nests and individual plants and animals) are also evaluated and discussed when impacts to these resources, in and of themselves, could be considered significant or conflict with local, state and federal statutes or regulations. The significance of direct impacts on individuals or populations of plant and animal species takes into consideration the number of individual plants or animals potentially affected, how common or uncommon the species is both on the project site and from a regional perspective and the species' sensitivity status according to resource agencies. These factors are evaluated based on the results of on-site biological surveys and studies, results of literature and database reviews, discussions with biological experts, and established and recognized ecological and biodiversity theory and assumptions.

11.2 DIRECT IMPACTS

The following section focuses on the direct effects of proposed project implementation on plant communities, common and special-status plant and wildlife species, special-status habitats, and wildlife movement corridors. To more directly address impacts to biological resources within the Newhall Ranch Specific Plan's River Corridor SMA/SEA 23, and where a clear distinction can be made, the following discussion has been structured to include an analysis of impacts to biological resources within the SMA/SEA boundary and an analysis of impacts to biological resources outside of the SMA/SEA boundary. Where appropriate, biological resources are generally included as part of the impact discussion of biological resources within the SMA/SEA boundary if any of the on-site biological resource occurs or is expected to occur within the SMA/SEA. **Figure 11A**, above, depicts the relationship between on-site plant communities and proposed land alteration.

The calculation of impacts to plant communities includes fire setback areas, except in those cases where grading occurs that isn't associated with a building footprint (such as for trails, bank stabilization, borrow sites, buried utility corridors, etc.).

An analysis of the "significance" of project impacts on biological resources is provided below. In addition, each impact discussion, notes whether the findings of this report are consistent with the findings of the previously certified Newhall Ranch Program EIR. If approved, the Landmark Village project would be subject to the mitigation measures/conditions of approval contained in the RMP of the Newhall Ranch Specific Plan and the Newhall Ranch Program EIR. These mitigation measures and conditions were adopted by the County Board of Supervisors in association with approval of the Newhall Ranch Specific Plan and WRP (May 27, 2003). The Newhall Ranch Specific Plan and WRP revised Mitigation Monitoring Plans are contained in **Appendix C**. Additional mitigation measures proposed to further mitigate significant impacts are included in **Section 13.0**.

11.2.1 Bio-1, Common Plant Communities

(i) Common Plant Communities Within the SMA/SEA 23

(a) Agricultural

The proposed project would result in the permanent conversion of 335.66 acres of land currently used for agricultural purposes. An additional 37.92 acres would be temporarily disturbed by bank stabilization

and/or haul roads, but would be revegetated to native vegetation following completion of construction**.** Of the total 373.60 acres of agricultural/developed land on the project site, 57.56 acres are within the boundaries of the SMA/SEA 23 (of which 24.04 acres would be developed and 33.51 acres would be temporarily disturbed). Given the disturbed condition of the area, and that this habitat type is not considered a natural community by resource agencies, the loss of agricultural land would be a less than significant impact. The Newhall Ranch Program EIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (**Bio-2, Wildlife Habitat Loss**, below).

(b) Non-Native Grassland

The proposed project would result in the permanent conversion of 118.30 acres of non-native grasslands. An additional 2.89 acres would be temporarily disturbed by bank stabilization and/or haul roads, but would be revegetated following completion of construction. Of the total 123.58 acres of non-native grassland on the project site, 4.03 acres is within the boundaries of the SMA/SEA 23 (of which 2.77 acres would be developed, and 1.26 acres would be temporarily disturbed). Small pockets of grassland occur in scattered locations along the eastern portion of the project site and within both off-site grading locations. Given the altered condition of these areas, and that this habitat type is not considered a sensitive natural community by resource agencies, the loss of non-native grassland would be a less than significant impact. The Newhall Ranch Program EIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (**Bio-2, Wildlife Habitat Loss**, below).

(c) Mulefat Scrub

The proposed project would result in the permanent conversion of 11.05 acres of mulefat scrub. An additional 8.26 acres would be temporarily disturbed by bank stabilization and/or haul roads, but would be revegetated following completion of construction. Of the total 11.05 acres of mulefat scrub on the project site, 8.59 acres are within the boundaries of the SMA/SEA 23 (of which 2.14 acres would be developed and 6.45 acres would be temporarily disturbed). Although mulefat scrub is not recognized as a sensitive natural community by resource agencies, given the extent of this plant community on the project site, and the on-going loss of riparian plant communities in the project area, without mitigation, the loss of mulefat scrub is considered to be a significant impact. Implementation of RMP Mitigation Measures 4.6-1 through 4.6-26, as well as the Newhall Ranch Program EIR Mitigation Measure 4.6-63 would, however, reduce impacts to this plant community to a less than significant level. The Newhall Ranch Program EIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (**Bio-2, Wildlife Habitat Loss**, below).

(d) Coastal Sage Scrub

The proposed project would result in the permanent conversion of 300.84 acres of coastal sage scrub. An additional 3.48 acres would be temporarily disturbed by bank stabilization and/or haul roads, but would be revegetated as coastal sage scrub following completion of construction. Of the total coastal sage scrub on the project site, 0.85 acre is within the boundaries of the SMA/SEA 23 (of which 1.32 acres would be permanently developed and 0.16 acre would be temporarily disturbed). Given the acreage that would be removed in the off-site grading sites and the reclaimed water tank site, and because of the habitat value this plant community provides for common and special-status plant and wildlife species, the loss of coastal sage scrub vegetation would be a significant impact. The Specific Plan RMP requires that a conservation agreement be established over the High Country SMA/SEA 20 and that a detailed program be developed for its long-term management and ownership. Virtually all of the existing High Country SMA/SEA 20 is retained in a natural state, including large expanses of coastal sage scrub habitat. Although implementation of RMP Mitigation Measures 4.6-37 through 4.6-43 would reduce impacts to coastal sage scrub, the net loss of this sensitive habitat type is still considered a significant impact. This finding is consistent with the findings of the Newhall Ranch Program EIR that identified the loss of coastal sage scrub habitat as a significant unavoidable impact.

(e) Elderberry Scrub

The proposed project would result in the permanent conversion of 8.22 acres of elderberry scrub. Of this area, 0.90 acre is within the boundaries of the SMA/SEA 23. Given that this plant community is relatively uncommon in the project area, without mitigation, the loss of elderberry scrub would be a significant impact. Implementation of RMP Mitigation Measure 4.6-43, as well as proposed Mitigation Measure 4.6-96, would reduce impacts to elderberry scrub to a less than significant level. This finding is consistent with the finding of the Newhall Ranch Specific Plan that impacts to elderberry scrub could be mitigated to below a level of significance.

(f) Arrow (SP) Weed Scrub

The proposed project would result in the permanent conversion of 5.72 acres of arrow weed scrub from the project site. An additional 0.73 acre would be temporarily disturbed by bank stabilization and/or haul roads, but would be revegetated following completion of construction. Of the total 6.45 acres of arrow weed scrub on the project site, 0.85 acre is within the boundaries of the SMA/SEA 23 (of which 0.16 acre would be developed and 0.70 acre would be temporarily disturbed). Given the disturbance nature of this plant community, and that this habitat type is not considered a sensitive natural community by

resource agencies, the loss of arrow weed scrub would be a less than significant impact. The Newhall Ranch Program EIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (**Bio-2, Wildlife Habitat Loss**, below).

(ii) Common Plant Communities Outside of the SMA/SEA 23

(a) Alluvial Scrub

The proposed project would result in the loss of 0.53 acre of alluvial scrub and the temporary disturbance to an additional 0.08 acre. Given the small area to be impacted and that this habitat type is not considered a sensitive natural community by resource agencies, the loss of alluvial scrub would be a less than significant impact. The Newhall Ranch Program EIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (**Bio-2, Wildlife Habitat Loss**, below).

(b) Great Basin Scrub

The proposed project would result in the development of 2.52 acres of great basin scrub and the temporary disturbance to an additional 0.53 acre. Given the small amount of acreage that would be impacted and that this habitat type is not considered a sensitive natural community by resource agencies, the loss of great basin scrub would be a less than significant impact. The Newhall Ranch Program EIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (**Bio-2, Wildlife Habitat Loss**, below).

(c) Coastal Sage Chaparral Scrub

The proposed project would result in the development of 12.50 acres of coastal sage chaparral scrub. This plant community is a dominant natural vegetation type in the region and is not considered a sensitive natural community in Southern California by resource agencies. Given the small amount of acreage that would be removed, and the common nature of this plant community in the project region, the loss of this plant community would be a less than significant impact. The Newhall Ranch Program EIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (**Bio-2, Wildlife Habitat Loss**, below).

11.2.2 Bio-2, Wildlife Habitat Loss

(i) Wildlife Habitat Loss Within the SMA/SEA 23

The proposed project would result in the permanent conversion of 59.59 acres of wildlife habitat within the SMA/SEA 23 boundary, of which 24.04 acres are agricultural land, 1.32 acres are coastal sage scrub, 0.16 acre is arrow weed scrub, 0.02 acre is live oak woodland, 2.77 acres is non-native grassland, 0.99 acre is river wash, and 23.80 acres are ruderal. A total of 6.48 acres to be developed consists of riparian-associated plant communities, including southern willow scrub, southern cottonwood willow riparian forest, mulefat scrub, freshwater marsh, and elderberry scrub. Developed uses within this area include Long Canyon Bridge Road, portions of the Regional River Trail, a scenic vista path, and portions of the utility corridor. An additional 64.98 acres of habitat within the SMA/SEA 23 would be temporarily disturbed by bank stabilization and/or haul roads, but would be planted with native vegetation following completion of construction. Given that the majority of land to be developed consists of agricultural areas and upland plant communities, the limited amount of riparian habitat that would be permanently altered, the amount of riparian habitat protected within the River Corridor SMA, and that the Specific Plan RMP includes measures (Mitigation Measures 4.6-1 to 4.6-26) that would replace any native vegetation temporarily or permanently removed, the loss of wildlife habitat within the SMA/SEA 23 is considered to be a less than significant impact. This finding is consistent with the findings of the Newhall Ranch Final Additional Analysis (May 2003).

(ii) Wildlife Habitat Loss Outside of the SMA/SEA 23

The proposed project would result in the permanent loss of 867.72 acres of wildlife habitat outside of the boundaries of the SMA/SEA 23, including large areas of coastal sage scrub habitat and agricultural land. An additional 80.72 acres will be temporarily impacted. While the plant communities occurring on the site are of varying botanical value, each of these plant communities provides habitat for a variety of wildlife species. When viewed individually, the loss of an individual plant community on the project site may not represent a substantial loss of wildlife habitat. However, as most wildlife species depend on a variety of habitat types to meet various ecological and life history requirements (i.e., food, shelter, nesting), when considered together, the loss of habitat provided by the on-site plant communities is substantial. Consistent with the findings of the Newhall Ranch Program EIR, the loss wildlife habitat would adversely affect numerous common and special-status wildlife species, including silvery legless lizard, rosy boa, San Bernardino ringneck snake, coast horned lizard, coast patch-nosed snake, northern harrier, white-tailed kite, southern rufous-crowned sparrow, Bell's sage sparrow, western burrowing owl, San Diego desert woodrat, mountain lion, and San Diego black-tailed jackrabbit (see **Bio-8, Special-Status Wildlife Species**, for a discussion of direct impacts to these species). Therefore, despite the fact

that this habitat is outside the SMA/SEA, the permanent net loss of 867.72 acres of currently undeveloped land represents a substantial loss of habitat for wildlife species and is considered a significant impact.

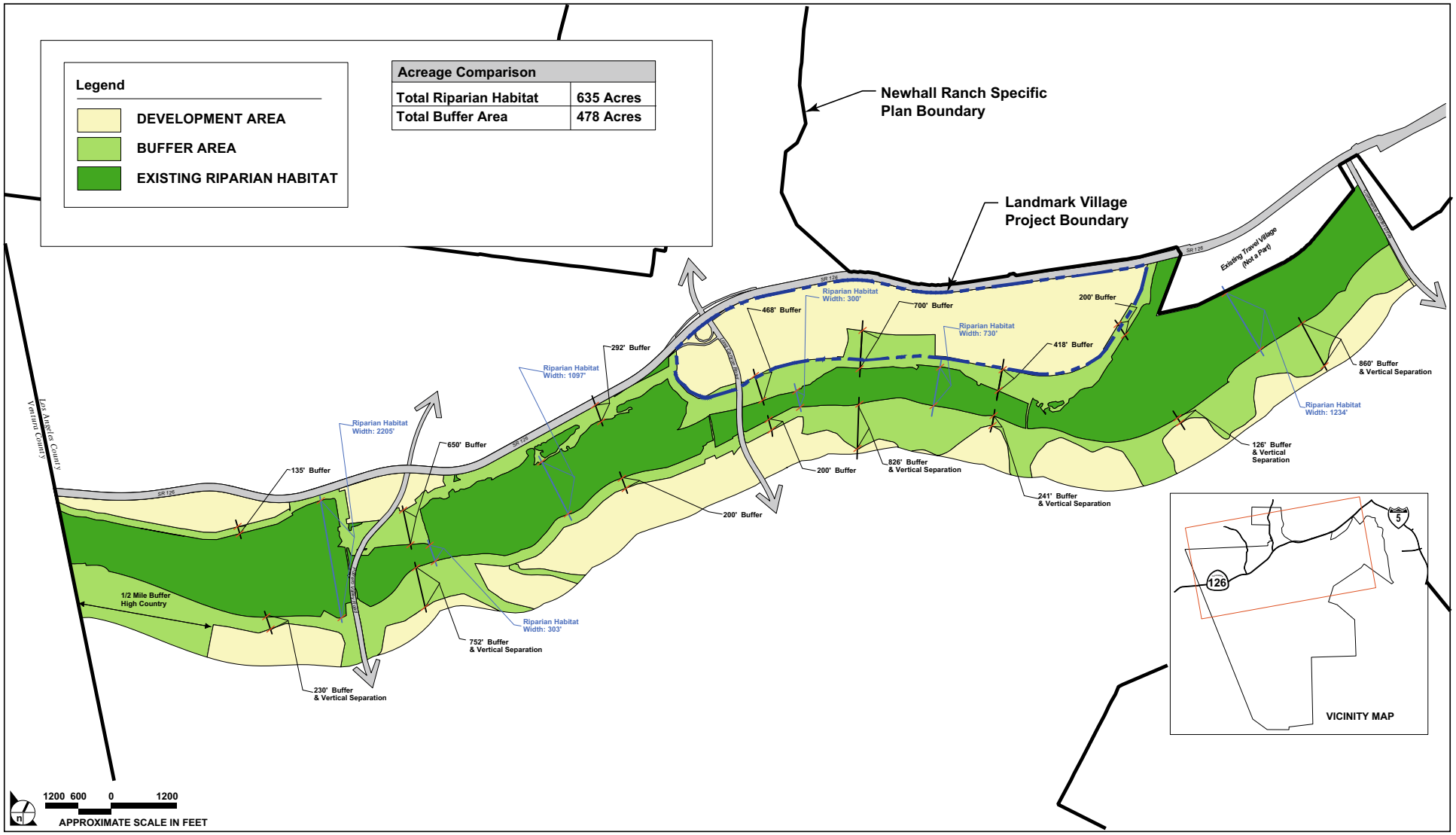
The Newhall Ranch Specific Plan designates a total of approximately 6,170 acres (51 percent of the total Newhall Ranch Specific Plan area) as open area and includes measures to enhance the biological value of the protected areas (RMP Mitigation Measures 4.6-27 through 4.6-43). While these measures would reduce the magnitude of impacts related to the loss of wildlife habitat, the net loss of 831.15 acres would remain unavoidably significant. This finding is consistent with the findings of the Newhall Ranch Program EIR that identified the loss of wildlife habitat as a significant unavoidable impact.

11.2.3 Bio-3, Setbacks From Riparian Resources Within SEA 23

The structural diversity of the various riparian and aquatic vegetation communities in the Santa Clara River drainage provides habitat for a large variety of wildlife species, including a number of special-status bird species. Each of these species has differing home range and natural history requirements. While some species are riparian-obligate (i.e., satisfy their forage, cover, and breeding habitat needs almost entirely within riparian vegetation communities), other species utilize both the riparian habitat as well as adjacent upland vegetation as part of their home range. A number of studies have found that even the more riparian-dependent wildlife species also require adjacent upland habitats to meet home range foraging and breeding requirements (Doyle 1990; Schaefer and Brown 1992), indicating that the overall viability of riparian associated wildlife species extends beyond the riparian canopy and includes adjacent upland habitat.

However, the characteristics, quality, and extent of upland habitat that is necessary to protect the diversity of wildlife species dependent upon riparian habitat may differ depending on the geographic region and the particular requirements of the riparian species to be protected. Previous studies have recommended preserving (and restoring, if necessary) a minimum of at least 100 feet of high quality upland habitat (upland preserve zone), as measured from the outer edge of the riparian habitat associated with the Santa Clara River ("resource line"), to adequately provide for the foraging and breeding habitat requirements of riparian-associated wildlife and to maintain species diversity within the riparian ecosystem, inclusive of the riparian/upland ecotone (Impact Sciences 1997).

As shown in **Figure 16, Riparian Habitat Buffers**, the proposed project maintains a buffer between the edge of existing riparian resources and proposed development on the tract map site ranging in width from 700 feet to 70 feet. This buffer is measured from the top of riverside bank stabilization to the lot line



SOURCE: FORMA – August 2001

FIGURE **16**

Riparian Habitat Buffers

32-92•06/05

of proposed residential, mixed-use, and commercial development. While the buffer is generally greater than 100 feet, the buffer is reduced to 70 feet for approximately 100 feet along the western boundary of the tract map (just to the south of SR-126). This area is located adjacent to Chiquito Canyon Creek in an area that has been disturbed by the construction and operation of SR-126, as well as by agricultural-related activities. The vegetation within the reduced buffer area is characterized by disturbed sandy soils and areas of sparse, disturbed riparian vegetation. This area is located to the north of the well-developed cottonwood willow riparian forest associated with the confluence of Chiquito Canyon Creek and the Santa Clara River. Given the proximity of the reduced buffer area to SR-126, and the disturbed condition and limited extent of riparian habitat present, use of the area by special-status bird or other wildlife species is expected to be limited. A minimum of a 100-foot buffer is present along all other portions of the tract map site and in all areas bordering mature cottonwood willow riparian forest and willow scrub habitats. Furthermore, the vegetation within portions of the setback or buffer area will be restored and/or enhanced to increase habitat values when compared to existing conditions. Given the above, the proposed riparian buffers are sufficient to maintain the function and values of the adjacent riparian habitat and to protect the diversity of riparian-associated wildlife species occurring within these areas. This finding is consistent with the findings of the Newhall Ranch Final Additional Analysis (May 2003) that concluded the proposed land use plan and other design features were sufficient to maintain the function and values of the riparian habitat within the SMA/SEA 23.

11.2.4 Bio-4, Common Wildlife Within and Outside of the SMA/SEA 23

In addition to the loss of vegetation and wildlife habitat, construction and grading activities associated with the proposed project would directly disturb common wildlife species on the project site. In particular, species of low mobility (particularly small mammals, amphibians and reptiles) would be eliminated during site preparation and construction. During the construction period, some wildlife species may emigrate from the project site and become vulnerable to mortality by predation, auto collisions and unsuccessful competition for food and territory.

Because of the common nature of wildlife species that would be displaced or inadvertently lost by construction activities, project implementation is not expected to reduce regional populations to below self-sustaining levels or otherwise substantially affect common fish, mammal or reptile species populations on or adjacent to the project site. Consequently, impacts to common fish, mammal and reptile species would be less than significant. The Newhall Ranch Program EIR did not address the construction-related loss of common wildlife as an individual topic, but did include an analysis of the overall loss of wildlife habitat (**Bio-2, Wildlife Habitat Loss**, above).

Construction activities could result in the direct loss or abandonment of active nests by adult birds of common bird species. The Migratory Bird Treaty Act and the California Fish and Game Code protect active nests of native bird species. (See 16 USC §§703-712; see also California Fish and Game Code §§3503, 3513.) Therefore, any construction-related loss of active nests of common bird species would conflict with these federal and state laws.

Implementation of Mitigation Measure 4.6-88 would ensure compliance with state and federal laws protecting active bird nests.

11.2.5 Bio-5, Wildlife Habitat Linkages Within and Outside of the SMA/SEA 23

The proposed project design would preserve the integrity of the Santa Clara River as a wildlife movement corridor and minimize impacts on local and regional wildlife movement by maintaining nearly all of the Santa Clara River as open space. The Specific Plan RMP includes measures (Mitigation Measures 4.6-1 to 4.6-26) that will minimize impacts to riparian vegetation and replace any vegetation temporarily or permanently removed. Therefore, the riparian vegetation that will be removed as a result of project implementation will not substantially affect the long-term ability of resident and non-resident species to use the river as a movement corridor.

The Long Canyon Road Bridge is proposed to be approximately 1,000 feet in length and a maximum of 100 feet in width. It will range from approximately 11–22 feet in height above the riverbed with an estimated 11 vertical support columns or piers extending into the riverbed. The piers will be approximately 100 feet apart from one another. When confronted with bridges or overpasses along a preferred movement corridor, wildlife, particularly larger mammals, will generally move under these structures as long as there is adequate vertical and horizontal spacing, a natural (dirt, sand, vegetation) substrate on which to travel while under the structure, and an "openness" effect that allows the animal to detect light, open space and habitat at the exiting end of the structure. The proposed bridge will adequately meet these requirements and is not expected to significantly alter wildlife movement along the river corridor.

Consistent with the findings of the Newhall Ranch Program EIR, development of the proposed project would limit northern access to or disbursement from the Santa Clara River for wildlife. However, given that the tract map site is currently used for agriculture and is frequently devoid of cover, the tract map site is not expected to be a substantial part of a regional north-south wildlife movement corridor. In light of the above, impacts to regional wildlife movement would be less than significant. The Newhall Ranch Program EIR found that, with implementation of the Newhall Ranch Specific Plan, impacts to the

movement of wildlife species would be significant due to the reduction in open land available for wildlife movement between the Santa Clara River and upland areas.

11.2.6 Bio-6, Special-Status Plant Species

As shown in **Table 9**, above, the following special-status plant species were eliminated from further consideration because they were not observed on or adjacent to the project site during focused plant surveys conducted on the site in 2001, 2002 and 2004: marsh sandwort, Braunton's milk-vetch, Coulter's saltbrush, Davidson's saltscale, Malibu baccharis, Nevin's barberry, thread-leaved brodiaea, Plummer's mariposa lily, late-flowering mariposa lily, southern tarplant, island mountain-mahogany, Santa Susana tarplant, slender-horned spineflower, Blochman's dudleya, marcescent dudleya, Santa Monica Mountains dudleya, many-stemmed dudleya, Conejo dudleya, Palmer's grappling hook, round-leaved filaree, Los Angeles sunflower, mesa horkelia, southwestern spiny rush, Davidson's bush mallow, California muhly, mud nama, spreading navarretia, chaparral nolina, short-joint beavertail cactus, California orcutt grass, Lyon's pentachaeta, Pringle's yampah, Gambel's watercress, rayless ragwort, Salt Spring checkerbloom and Sonoran maiden fern. Given the thoroughness of the previous survey efforts (**Table 5**), it is unlikely that any of these species are present on the site and, therefore, no significant impacts to these plant species are expected to occur.

Special-status plant species that were observed on the project site during the focused special-status plant surveys include slender mariposa lily, Peirson's morning-glory and Southern California black walnut. In addition, as stated above, a previously undescribed species of everlasting was observed and several populations of San Fernando Valley spineflower have been documented near the disturbance boundary of the borrow site south of the Santa Clara River. Impacts to these species are discussed below.

(i) Special-Status Plants within the SMA/SEA 23

While the undescribed species of **everlasting** that was observed on the project site currently has no sensitivity status, because of its apparent rarity, it is expected to be assigned a sensitivity status by CNPS or state/federal resource agencies in the future. The County has been informed of the presence of this undescribed species on the Newhall Ranch Specific Plan area and work is being conducted by UC Riverside herbarium staff to describe this species and to learn more about its distribution in California. This species has been collected relatively few times and most collections are old. Of the 14 collections, eight date from 1901 to 1987 and six more recent collections date from 1994 to 2003. Many are from somewhat vague localities, such as "San Fernando Valley" and "Pasadena," but are in areas that have now been substantially urbanized. Modern collections, outside of the Newhall Ranch Specific Plan area, have

come mostly from the Santa Ana Mountains region and especially Temescal Wash, in western Riverside County with several collections from adjacent San Diego County.

As previously discussed, two populations of this undescribed species were observed on the project site (within the Santa Clara River and Castaic Creek) during surveys conducted in 2003 and 2004. One of these populations was documented as partially occurring within the proposed utility corridor (to the east of the tract map site) while the other population was documented within the proposed haul route across the Santa Clara River. On May 27, 2005, Dudek & Associates surveyed the project site to evaluate the current condition of these populations of everlasting. No populations of everlasting were observed on or near the project footprint during these surveys. The large storm events of 2005 and associated large flows within Castaic Creek and the Santa Clara River resulted in extensive scouring and the removal of the terraces and benches on which the plants previously occurred. As several feet of channel bottom was washed away, the existing seedbank within these locations was also presumably washed downstream. On June 7, 2005, Dudek & Associates and County biologists observed many everlasting plants and seedlings within Castaic Creek north of SR-126 and five everlasting seedlings on a bench within Castaic Creek, south of SR-126, outside of the project footprint but within the project study area. Based on current conditions, the proposed project would not result in the loss of any extant populations of this undescribed species of everlasting. However, given the potential of seeds from plant populations upstream of the project site to be washed onto the site, there is potential that this species could occur within the project boundaries in the future. Should this occur, the loss of individual plants of this undescribed species would be considered a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-100 would reduce impacts to below a level of significance. Impacts to this species were not previously analyzed as part of the Newhall Ranch Program EIR and Additional Analysis because the plant was identified after that environmental documentation was certified.

(ii) Special-Status Plants Outside of the SMA/SEA 23

Slender mariposa lily has no state or federal status, but is a CNPS List 1B plant. Los Angeles County considers it a "species of special concern" as this species appears to be endemic to Los Angeles County and is threatened by urban development. The proposed project would result in the loss of an estimated 887 individual plants (see, **Figure 14**). Given the sensitivity of this species, and that Los Angeles County considers it a "species of special concern," impacts to this species would be significant. Implementation of proposed Mitigation Measure 4.6-99 (see **Section 13.2** below) would reduce impacts to this species to below a level of significance. The finding that impacts to this species can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR and Additional Analysis.

Peirson's morning-glory has no state or federal status, but is a CNPS List 4 plant. This species has been documented on the project site within the off-site grading sites (FLx 2002). The proposed project would result in the loss of Peirson's morning-glory from these locations. While never abundant, Peirson's morning-glory occurs throughout the Newhall Ranch Specific Plan area on virtually all ridges and slopes (Dudek & Associates 2004). Because of the common occurrence of Peirson's morning-glory within the Newhall Ranch Specific Plan area, and because CNPS List 4 plants are not considered Rare from a statewide perspective, are not defined as Rare, Threatened or Endangered pursuant to the California Endangered Species Act, are not eligible for state listing as Threatened or Endangered, and the vulnerability or susceptibility to threats on a statewide basis are considered low at this time (CNPS 2004), the loss of Peirson's morning-glory would not be considered a substantial adverse effect on a special-status species, nor would it be expected to reduce regional populations of the species to below self-sustaining numbers. Therefore, impacts to Peirson's morning-glory would be less than significant. This finding is consistent with the findings of the Newhall Ranch Program EIR and Additional Analysis, which found that impacts to this species would not be significant assuming implementation of Mitigation Measures 4.6-27, 4.6-34, 4.6-35 and 4.6-53.

Southern California black walnut has no state or federal status, but is a CNPS List 4 plant. The proposed project would result in the removal of 10 black walnut trees. CNPS List 4 plants are not considered Rare from a statewide perspective, are not defined as Rare, Threatened or Endangered pursuant to the California Endangered Species Act, are not eligible for state listing as Threatened or Endangered, and the vulnerability or susceptibility to threats on a statewide basis are considered low at this time (CDFG 2000). Implementation of RMP Measure 4.6-48 would reduce impacts to this species to below a level of significance. This finding is consistent with the findings of the Newhall Ranch Program EIR.

No populations of San Fernando Valley spineflower occur within the project boundaries or within 100 feet of the project site's disturbance boundaries. Therefore, no direct impacts to this species would occur. One population occurs at a location surrounded by the borrow site (but that maintains an approximately 100-foot buffer from areas that would be disturbed). Another population occurs to the west of the borrow site's disturbance boundary but also maintains a minimum 100-foot buffer from areas that would be disturbed. Given the proximity of populations to areas that would be disturbed, without the incorporation of avoidance measures, these populations of San Fernando Valley spineflower could be indirectly impacted by construction-related activities. Consistent with the requirements of the RMP (4.6-68), these areas would be fenced with temporary orange fencing during grading/construction to ensure that no disturbance will take place within this buffer. As also required by the RMP (4.6-67), the buffer area would be revegetated with a native seed mix to prevent erosion and reduce the potential of invasive

plants from encroaching on the preserved spineflower populations. The grading concept considered the effects of indirect impacts associated with altered hydrologic patterns. Manufactured slopes surrounding the plant population have been contoured to direct storm water runoff away from the plants. Since the population occurs at a high point, the amount and location of runoff received by these populations would not be affected in the post developed condition. The proposed grading concept, proposed buffers, and implementation of the above RMP measures, would reduce the potential for significant indirect impacts to San Fernando Valley spineflower.

11.2.7 Bio-7, Protected Oaks and Live Oak Woodland

As previously discussed (**Section 9.1.3, Oaks**), CLATO protects any species in the genus *Quercus* that are at least 8 inches in diameter or has a combined trunk circumference of any two trunks of at least 38 inches (12 inches in diameter), as measured 4.5 feet above the mean natural grade. A heritage oak, as defined by CLATO, is an oak tree that measures 36 inches or more in diameter as measured 4.5 feet above natural ground, or any oak of 36 inches or greater in diameter having a significant historical or cultural importance to the community. CLATO requires that all potential impacts to oak trees be preceded by an application to the County that includes a detailed oak tree report, and that loss of or damage to protected oaks be mitigated at a minimum 2:1 ratio.

Based on the proposed grading plan, 7.82 acres of coast live oak woodland would be removed (this includes approximately 12 "heritage" oak trees). However, several (approximately 22) oak trees would remain in place and would not be impacted by the Landmark Village project. Given the biological value of oak woodlands, and that the project would result in the removal or impacts to oak trees, the loss of oak woodland and protected oak trees is considered a significant impact under CLATO.

As also previously discussed, Senate Bill 1334, Kuehl, Oak Woodlands Conservation, contains provisions for counties to mitigate impacts to oak woodlands that would be significant under CEQA. Senate Bill 1334 provides for several mitigation alternatives that can be implemented to mitigate significant impacts on oak woodlands. Among the options are the preservation of oak woodlands under conservation easements and the planting of oak trees to replace those lost or damaged. As discussed in the Newhall Ranch Specific Plan, 2.6 Resource Management Plan, an estimated 13,660 oak trees would be protected within the SMA, particularly in the High Country SMA. Further, as discussed in the Newhall Ranch Specific Plan, 2.6 Resource Management Plan, suitable areas exist in the High Country SMA for the restoration of oak resources and the enhancement of existing stands of preserved oaks (see Newhall Ranch Specific Plan, Exhibit 2.6-9, Potential Oak Tree Restoration Areas). These include areas in the upper elevations of the Santa Susana Mountains that have been disturbed by grazing. Additional

opportunities exist within the open area[6] where oak resources can be planted as an expansion of existing oak woodlands or savannahs. Oak trees would be planted in these areas such that a minimum of 7.82 acres of oak woodland would be enhanced. The actual number of trees to be planted would be that number necessary to comply with all mitigation measures stipulated in the Oak Tree Permit issued by the County pursuant to CLATO and CEQA. Given preservation of an estimated 13,600 oak trees within the SMA, the opportunities in the High Country SMA for the restoration and enhancement of a minimum of 7.82 acres of oak woodland, compliance with the permit conditions and implementation of Specific Plan RMP Measure 4.6-48, as well as proposed Mitigation Measures 4.6-98 and 4.6-101 (see **Section 13.2** below), impacts to oak trees and oak woodland habitat would be reduced to below a level of significance. These measures would also meet the requirements of Senate Bill 1334. The finding that impacts to protected oaks can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

11.2.8 Bio-8, Special-Status Wildlife Species

Certain special-status wildlife species that are known to occur in the project region were eliminated from further consideration in this report because the project site lacks suitable habitat to support the species as a resident or nesting species or because surveys have established that the species is not expected to frequently utilize the project site. As a result, the species are not expected to reside on or substantially utilize the project site. As shown in **Table 9**, these species include the following: San Diego fairy shrimp, Riverside fairy shrimp, San Emigdio blue butterfly, quino checkerspot butterfly, steelhead rainbow trout, California red-legged frog, sharp-shinned hawk, great egret, great blue heron, ferruginous hawk, prairie falcon, least bittern, bank swallow, spotted bat, southern grasshopper mouse and Los Angeles pocket mouse.

As noted in **Table 7**, above, the following special-status wildlife species were observed during the course of various field surveys conducted on or adjacent to the project site: Santa Ana sucker, unarmored threespine stickleback, arroyo chub, silvery legless lizard, southwestern pond turtle, two-striped garter snake, Cooper's hawk, Southern California rufous-crowned sparrow, Lawrence's goldfinch, northern harrier, yellow warbler, white-tailed kite, California horned lark, yellow-breasted chat, least Bell's vireo, pallid bat and San Diego desert woodrat.

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6 Open area is a land use designation for those portions of the Specific Plan area outside of the SMAs and between development planning areas.

Based on the presence of suitable habitat on the project site, it is reasonable to conclude that certain special-status species could potentially occur on site prior to grading or construction activities associated with project implementation. (**Table 8**, above.) Although not observed during surveys, the following species could occur on the project site: monarch butterfly, arroyo toad, western spadefoot toad, coastal western whiptail, rosy boa, San Bernardino ringneck snake, coast horned lizard, coast patch-nosed snake, tricolored blackbird, Bell's sage sparrow, long-eared owl, western burrowing owl, western yellow-billed cuckoo, southwestern willow flycatcher, merlin, loggerhead shrike, summer tanager, pale big-eared bat, western mastiff bat, mountain lion, San Diego black-tailed jackrabbit, fringed myotis, yuma myotis, and American badger.

(i) Impacts to Species Observed On or Adjacent to the Landmark Village Site

(a) Special-Status Wildlife Species Occurring Within SEA 23

Santa Ana sucker (*Catostomus santaanae*), ***California Species of Special Concern***. This species has been documented in the Santa Clara River and could occur in the portion of the river on and adjacent to the project site. Construction activities associated with the proposed Long Canyon Road Bridge, bridge abutments, and temporary haul routes could result in the loss of individual fish. The location of the proposed bank stabilization features is set back beyond the existing riparian corridor in a majority of the project site and would not interface with the active stream channel. Depending on the number and extent of this species that may be disturbed or removed during construction of the bridge, the loss of Santa Ana sucker would be a significant impact. Implementation of Newhall Ranch Program EIR Mitigation Measure 4.6-57, as well as Mitigation Measures 4.6-81, 4.6-82, 4.6-83, 4.6-84, 4.6-85, and 4.6-86 (which are proposed as part of this Biota Report; see below) would reduce direct impacts to the Santa Ana sucker to below a level of significance. The finding that impacts to Santa Ana sucker can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), ***Federal Endangered, California Endangered, California Fully Protected***. This species has been documented in the Santa Clara River adjacent to the project site. Construction activities associated with the proposed Long Canyon Road Bridge, bridge abutments, and temporary haul routes could result in the loss of individual fish. The location of the proposed bank stabilization features is set back beyond the existing riparian corridor in a majority of the project site and would not interface with the active stream channel. The loss of unarmored threespine stickleback would be a significant impact. Implementation of Newhall Ranch Program EIR Mitigation Measures 4.6-54, 4.6-57, 4.6-59, as well as the proposed Mitigation Measures 4.6-81, 4.6-82, 4.6-83, 4.6-84, 4.6-85 and 4.6-86 would reduce direct impacts to the unarmored threespine

stickleback to below a level of significance. The finding that impacts to unarmored threespine stickleback can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Arroyo chub (*Gila orcutti*), ***California Species of Special Concern***. This species has been documented in the Santa Clara River and could occur in the portion of the river adjacent to the project site. Construction activities associated with the proposed Long Canyon Road Bridge, bridge abutments, and temporary haul routes could result in the loss of individual fish. The location of the proposed bank stabilization features is set back beyond the existing riparian corridor in a majority of the project site and would not interface with the active stream channel. Depending on the number and extent of this species that may be disturbed or removed during construction of the bridge, the loss of arroyo chub would be a significant impact. Implementation of Newhall Ranch Program EIR Mitigation Measures 4.6-57, as well as the proposed Mitigation Measures 4.6-81, 4.6-82, 4.6-83, 4.6-84, 4.6-85 and 4.6-86 would reduce direct impacts to the arroyo chub to a less than significant level. The finding that impacts to arroyo chub can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Silvery legless lizard (*Anniella pulchra pulchra*), ***California Species of Special Concern.*** This species has been observed on the project site in Chiquito Canyon. Because suitable habitat occurs on site in the form of riparian and riverbank habitats within the SMA/SEA 23, as well as scrub, chaparral and oak woodland habitats outside of the SMA/SEA boundary, silvery legless lizard could occur throughout those portions of the site with these habitat types. Construction-related activities could result in the direct loss of individual lizards. Implementation of proposed Mitigation Measure 4.6-89 and 4.6-98 would reduce the magnitude of direct impacts. However, given the amount of potentially occupied habitat to be developed and/or disturbed, direct impacts to this species would still be considered significant. This finding is consistent with the findings of the Newhall Ranch Program EIR that concludes the substantial loss of habitat, and potentially the direct loss if individuals of this species, would be considered an unavoidable significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

Southwestern pond turtle (*Clemmys marmorata pallida*), ***California Species of Special Concern.*** This species has been observed in the portion of the Santa Clara River bordering the project site (Compliance Biology 2004), and could also occur within the riparian habitats on and bordering the project site. The removal of riparian vegetation and construction activities associated with the proposed bridge and/or bank protection could result in the loss of individual pond turtles. Depending on the number and extent of this species that may be disturbed or removed, the loss of pond turtles would be a potentially

significant impact. Implementation of proposed Mitigation Measures 4.6-81, 4.6-82, 4.6-83, 4.6-84, 4.6-85, 4.6-89, and 4.6-98 would reduce impacts to the southwestern pond turtle to a less than significant level. The finding that impacts to southwestern pond turtle can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Two-striped garter snake (*Thamnophis hammondii*), ***California Species of Special Concern.*** This species has been documented in the Santa Clara River and could occur within the portion of the river bordering the project site and within the riparian habitats on and bordering the project site. The removal of riparian vegetation and construction activities associated with the proposed bridge and/or bank protection could result in the loss of individual two-striped garter snakes. Depending on the number and extent of this species that may be disturbed or removed, the loss of two-striped garter snake would be a potentially significant impact. Implementation of proposed Mitigation Measures 4.6-81, 4.6-82, 4.6-83, 4.6-84, 4.6-85, 4.6-89, and 4.6-98 would reduce impacts to the two-striped garter snake to a less than significant level. The finding that impacts to two-striped garter snake can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Cooper's hawk (*Accipiter cooperii*), ***California Species of Special Concern.*** The riparian woodland on and bordering the project site provides suitable nesting habitat for this species. Cooper's hawks have been observed nesting on the project site (Guthrie 2004). If present, the proposed removal of riparian vegetation and/or construction-related noise could result in the loss or abandonment of active nests during that year's nesting season. Depending on the number and extent of this species' bird nests of on the site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting Cooper's hawks to below a level of significance. The finding that impacts to Cooper's hawk can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Lawrence's goldfinch (*Carduelis lawrencei*), ***Federal Bird of Conservation Concern.*** This species has been observed in the riparian and oak woodland habitats on and bordering the project site, which provide suitable nesting habitat for this species (Guthrie 2004). If present, construction-related activities could result in the loss or abandonment of active nests during that year's nesting season. Depending on the number and extent of bird nests on the site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting Lawrence's goldfinches to below a level of significance. Impacts to this species were not previously analyzed as an individual topic at the program level in the Newhall Ranch Program EIR.

Northern harrier (*Circus cyaneus*), ***California Species of Special Concern.*** This species has been observed foraging on the project site (Impact Sciences 2004). Suitable nesting habitat occurs in association with the agricultural and grassland habitats on site. Should this species nest on the project site, construction-related activities could result in the loss or abandonment of active nests. Depending on the number and extent of this species' active nests on site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting northern harriers to a less than significant level. The Newhall Ranch Program EIR concludes that due to the substantial loss of habitat resulting from buildout of the Specific Plan, impacts to northern harrier would be considered a significant unavoidable impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

Yellow warbler (*Dendroica petechia brewsteri*), ***California Species of Special Concern.*** The riparian habitats on and bordering the project site provide suitable nesting habitat for this species, which has been observed on the project site (Guthrie 2004). If present, the proposed removal of riparian vegetation and/or construction-related noise could result in the loss or abandonment of active nests during that year's nesting season. Depending on the number and extent of bird nests on the site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting yellow warblers to below a level of significance. The finding that impacts to yellow warbler can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

White-tailed kite (*Elanus leucurus*), ***California Fully Protected.*** This species has been observed on the project site (Guthrie 2004). The riparian and oak woodland habitats, as well as the eucalyptus trees on the project site provide suitable nesting habitat. If present, construction-related activities could result in the loss or abandonment of active nests during that year's nesting season. Depending on the number and extent of this species' bird nests that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting white-tailed kites to a less than significant level. The Newhall Ranch Program EIR concludes that due to the substantial loss of habitat resulting from buildout of the Specific Plan, impacts to white-tailed kite would be considered unavoidably significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

California horned lark (*Eremophila alpestris*), ***California Species of Special Concern.*** This species has been observed foraging on the project site (Impact Sciences 2004). Suitable nesting habitat occurs in association with the agricultural and grassland habitats on site. Should this species nest on the project site, construction-related activities could result in the loss or abandonment of active nests. Depending on the number and extent of active nests on site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting California horned larks to below a level of significance. Impacts to this species were not addressed by the Newhall Ranch Program EIR due to more recent identification of the species in later surveys.

Yellow-breasted chat (*Icteria virens*), ***California Species of Special Concern.*** The riparian habitats on and bordering the project site provide suitable nesting habitat, which has been observed on the project site (Guthrie 2004). If present, the proposed removal of riparian vegetation and/or construction-related noise could result in the loss or abandonment of active nests during that year's nesting season. Depending on the number and extent of bird nests on the site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting yellow-breasted chats to a less than significant level. Impacts to this species were not addressed by the Newhall Ranch Program EIR due to more recent identification of the species in later surveys.

Least's Bell's vireo (*Vireo bellii pusillus*), ***Federal Endangered, California Endangered.*** The riparian habitats on and bordering the project site provide suitable nesting habitat. Although no individuals have been observed nesting on the site, this species has been observed nesting a short distance to the east and west of the tract map boundaries (Guthrie 2004). If present, the proposed removal of riparian vegetation and/or construction-related noise could result in the loss or abandonment of active nests during that year's nesting season. Depending on the number and extent of this species' bird nests on site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting least Bell's vireos to below a level of significance. The finding that impacts to least Bell's vireo can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Pallid bat (*Antrozous pallidus*), ***California Species of Special Concern***. This species was detected on the project site during ANABAT surveys conducted in 2004, and is expected to forage on the project site and bordering areas. The project site lacks the preferred roosting habitat (i.e., rocky outcrops and crevices) of this species and, therefore, this species is not expected to roost on the project site. As the proposed project would not result in the loss of active roosts of this species, no impacts to roosting bats would

occur. The finding that impacts to pallid bat are less than significant is consistent with the findings of the Newhall Ranch Program EIR.

(b) Special-Status Wildlife Species Occurring Outside of the SMA/SEA 23

Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), ***California Species of Special Concern.*** This species is a fairly common resident at the off-site grading sites and could nest at these locations (Guthrie 2004). Construction-related activities could result in the loss or abandonment of active nests during that year's nesting season. Depending on the number and extent of this species' bird nests on the site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting Southern California rufus-crowned sparrows to a less than significant level. The Newhall Ranch Program EIR concludes that due to the substantial loss of habitat resulting from buildout of the Specific Plan, impacts to Southern California rufous-crowned sparrow would be considered unavoidably significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

San Diego desert woodrat (*Neotoma lepida intermedia*), ***California Species of Special Concern***. Desert woodrats were observed on both off-site grading sites during mammal surveys conducted in 2004. In the absence of contrary evidence, it is assumed that the animals observed were the San Diego (*intermedia*) subspecies. Construction-related activities would result in the direct loss of individual woodrats or active woodrat nests (stick houses). Implementation of proposed Mitigation Measure 4.6-89 and 4.6-98 would reduce the magnitude of impacts to the San Diego desert woodrat. However, given the amount of potentially occupied habitat to be developed and/or disturbed, direct impacts to this species would still be considered significant. This finding is consistent with the findings of the Newhall Ranch Program EIR that concludes the substantial loss of habitat, and potentially the direct loss if individuals of this species, would be considered an unavoidable significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

(ii) Impacts to Species Potentially Occurring on the Landmark Village Site

(a) Special-Status Wildlife Potentially Occurring Within the SMA/SEA 23

Arroyo toad (*Bufo californicus*), ***Federal Endangered, California Species of Special Concern***. The riparian areas on and adjacent to the project site provide suitable habitat for this species. However, based on the results of protocol surveys, it appears that arroyo toads are not breeding or otherwise utilizing habitats

on or bordering the project site (Compliance Biology 2004). In addition, on April 13, 2005, the USFWS issued a revised critical habitat designation for the arroyo toad. (See 70 Fed.Reg. 19562.) In that Final Rule, effective May 13, 2005, the USFWS deleted the entire Newhall Ranch Specific Plan area from the designated critical habitat for the arroyo toad. However, arroyo toad have been documented in low numbers upstream of the project site, and given the presence of suitable habitat, it is possible that arroyo toad could occupy habitats on or adjacent to the project site prior to the commencement of construction activities. Should arroyo toad occur, construction-related activities could result in the loss of individual toads, which would be a significant impact. Implementation of proposed Mitigation Measures 4.6-81, 4.6-82, 4.6-83, and 4.6-84 would reduce impacts to the arroyo toad to below a level of significance. The finding that impacts to arroyo toad can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Western spadefoot (*Scaphiopus hammondii*), ***California Species of Special Concern.*** This species was not observed on the project site during focused surveys (Compliance Biology 2004). Seasonal backwater areas associated with the drainages on and bordering the site, as well as depressions within existing dirt roads, provide breeding habitat. Given documented occurrences of the species in the project area, and the presence of suitable breeding habitat, western spadefoot could occur on the project site. Depending on the number and extent of western spadefoot on the site that may be disturbed or removed, the loss of this species would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-97 would reduce impacts to western spadefoot to a less than significant level. The finding that impacts to western spadefoot can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Coastal western whiptail (*Aspidoscelis tigris stehnegeri*), ***California Special Animal.*** This species has not been observed on the project site. However, suitable habitat occurs in association with grassland, scrub, riverbank and oak woodland habitats on site, and coastal western whiptail could occur in areas supporting these habitat types. Should this species occur on site, construction-related activities could result in the direct loss of individual whiptails. Implementation of proposed Mitigation Measures 4.6-89 and 4.6-98 would reduce the magnitude of impacts to the coastal western whiptail. However, given the amount of potentially occupied habitat to be developed and/or disturbed, direct impacts to this species would still be considered significant. This finding is consistent with the findings of the Newhall Ranch Program EIR that concludes the substantial loss of habitat, and potentially the direct loss if individuals of this species, would be considered an unavoidable significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss. Impacts to this species were not previously analyzed as an individual topic at the program level in the Newhall Ranch Program EIR**.**

Rosy boa (*Charina trivirgata*), ***California Special Animal.*** This species has not been observed on the project site. However, suitable habitat occurs in association with scrub, chaparral, riverbank and oak woodland habitats, and rosy boa could occur in portions of the site supporting these habitat types. Should this species occur on site, construction-related activities could result in the direct loss of individual animals. Implementation of proposed Mitigation Measures 4.6-89 and 4.6-98 would reduce the magnitude of impacts to the rosy boa. However, given the amount of potentially occupied habitat to be developed and/or disturbed, direct impacts to this species would still be considered significant. This finding is consistent with the findings of the Newhall Ranch Program EIR that concludes the substantial loss of habitat, and potentially the direct loss if individuals of this species, would be considered an unavoidable significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

San Bernardino ringneck snake (*Diadophis punctatus modestus*), ***California Special Animal.*** This species has not been observed on the project site. However, suitable habitat occurs in association with scrub, chaparral, riverbank and oak woodland habitats, and San Bernardino ringneck snake could occur in portions of the site supporting these habitat types. Should this species occur on site, construction-related activities could result in the direct loss of individual animals. Implementation of proposed Mitigation Measures 4.6-89 and 4.6-98 would reduce the magnitude of impacts to the San Bernardino ringneck. However, given the amount of potentially occupied habitat to be developed and/or disturbed, direct impacts to this species would still be considered significant. This finding is consistent with the findings of the Newhall Ranch Program EIR that concludes the substantial loss of habitat, and potentially the direct loss if individuals of this species, would be considered an unavoidable significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

Coast horned lizard (*Phrynosoma coronatum*), ***California Species of Special Concern.*** This species has not been observed on the project site. However, suitable habitat occurs in association with scrub, chaparral and riverbank habitats on site, and coast horned lizard could occur in areas supporting these habitat types. Should this species occur on site, construction-related activities could result in the direct loss of individual horned lizards. Implementation of proposed Mitigation Measures 4.6-89 and 4.6-98 would reduce the magnitude of impacts to the coast horned lizard. However, given the amount of potentially occupied habitat to be developed and/or disturbed, direct impacts to this species would still be considered significant. This finding is consistent with the findings of the Newhall Ranch Program EIR that concludes the substantial loss of habitat, and potentially the direct loss if individuals of this species, would be considered an unavoidable significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

Tricolored blackbird (*Agelaius tricolor*), ***Federal Bird of Conservation Concern, California Species of Special Concern.*** Although the riparian habitats on and bordering the project site provide suitable nesting habitat, no individuals or nesting colonies have been observed on site. However, should this species nest on the site prior to development, construction-related activities could result in the loss or abandonment of active nests during that year's nesting season. Depending on the number and extent of bird nests on the site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting tricolored blackbirds to a less than significant level.

The Newhall Ranch Program EIR concludes that given the potential to re-locate breeding colonies at new locations is relatively low, impacts to breeding colonies (if present) would remain significant. However, given that no breeding colonies have been documented on or adjacent to the project site during annual bird surveys, and the requirements of proposed Mitigation Measure 4.6-88, impacts to nesting tricolored blackbird (if present) can be reduced to below a level of significance at the project-level.

Long-eared owl (*Asio otus*), ***California Species of Special Concern.*** The riparian and oak woodland habitats on and bordering the project site provide suitable nesting habitat for this species. Should this species occur on the site, construction-related activities could result in the loss or abandonment of active nests during that year's nesting season. Depending on the number and extent of bird nests on site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting long-eared owls to a less than significant level. Impacts to this species were not addressed by the Newhall Ranch Program EIR.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), ***Federal Candidate for Listing, Federal Bird of Conservation Concern, California Species of Special Concern.*** This species has not been observed nesting on the project site; however, one individual, thought to be a migrant, was observed during surveys in the project area (Guthrie 1997). In addition, suitable habitat does occur in association with the riparian habitats on site, and western yellow-billed cuckoo could nest in those areas. Should this species occur on the site, construction-related activities could result in the loss or abandonment of active nests. Depending on the number and extent of active nests on site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting western yellow-billed cuckoos to a less than significant level. Impacts to this species were not addressed by the Newhall Ranch Program EIR.

Southwestern willow flycatcher (*Empidonax trailii extimus*), ***Federal Endangered.*** This species has not been observed nesting on the project site during annual bird surveys. A single willow flycatcher was observed east of the project site foraging along the Santa Clara River on May 31, 2004 (Guthrie 2004); however, given the timing of this observation and lacking any subsequent evidence of nesting, the observed willow flycatcher cannot be positively identified as belonging to the southwestern category of willow flycatchers (Guthrie 2004). However, suitable nesting habitat does occur in association with the riparian habitats on site, and southwestern willow flycatcher could nest in those areas. Should this species occur on site, construction-related activities could result in the loss or abandonment of active nests. The loss of active nests would be a significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting southwestern willow flycatchers to a less than significant level. The finding that impacts to southwestern willow flycatcher can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Merlin (*Falco columbarius*), ***California Species of Special Concern.*** This species is not known to nest in California, but CDFG considers wintering merlins in California to be of Special Concern. The woodland and open areas on the site provide suitable habitat to support this species as a winter migrant; however, given the mobility of the species, the proposed project is not expected to result in the direct loss of individual merlins. Therefore, direct impacts to this species would be less than significant. Impacts to this species were not addressed by the Newhall Ranch Program EIR.

Summer tanager (*Piranga rubra*), ***California Species of Special Concern.*** This species has not been observed nesting on the project site during annual bird surveys. However, suitable habitat occurs in association with the riparian habitats on the site, and summer tanager could nest in those areas. Should this species occur on site, construction-related activities could result in the loss or abandonment of active nests. Depending on the number and extent of this species' active nests on site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting summer tanagers to a less than significant level. The finding that impacts to summer tanager can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Pale big-eared bat (*Corynorhinus townsendii pallescens*), ***California Species of Special Concern;*** **western mastiff bat** (*Eumops perotis*), ***California Species of Special Concern*****; fringed myotis** (*Myotis thysanodes*), ***Special Animal*****; yuma myotis** (*Myotis yumanemsis*), ***Special Animal***. These bat species have not been observed on the project site, but given the presence of suitable habitat, these species could roost and/or forage on or adjacent to the site. Should active bat roosts be present, construction related activity could result in the direct loss or abandonment of active roost sites. Implementation of proposed Mitigation

Measure 4.6-90 would reduce impacts to roosting bats to below a level of significance. The finding that impacts to special-status bats can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

Mountain lion (*Felis concolor browni*), ***California Fully Protected***. The project site could be part of a lion's home range or host transient individuals. However, given the mobility of this species, the proposed project is not expected to result in the direct loss of individual mountains lions. Therefore, direct impacts to this species would be less than significant. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

(b) Special-Status Wildlife Potentially Occurring Outside the SMA/SEA 23

Monarch butterfly (*Danaus plexippus*). The row of eucalyptus trees on the project site provides potential winter roosting habitat but is considered of limited roosting-value as the trees occur within an agricultural field and are not wind protected. Monarch butterflies have not been observed using these trees as winter roost sites. As overwintering monarch butterflies are not known or expected to substantially utilize the project site, impacts to overwinter monarchs from development of the site would be less than significant. Impacts to this species were not previously addressed by the Newhall Ranch Program EIR.

Coast patch-nosed snake (*Salvadora hexalepis virgultea*), ***California Species of Special Concern***. This species has not been observed on the project site. However, suitable habitat occurs in association with scrub habitat on site, which could support this species. Should this species occur on the site, construction-related activities could result in the direct loss of individual animals. Implementation of proposed Mitigation Measures 4.6-89 and 4.6-98 would reduce the magnitude of impacts to the coast patch-nosed snake. However, given the amount of potentially occupied habitat to be developed and/or disturbed, direct impacts to this species would still be considered significant. This finding is consistent with the findings of the Newhall Ranch Program EIR that concludes the substantial loss of habitat, and potentially the direct loss if individuals of this species, would be considered an unavoidable significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

Bell's sage sparrow (*Amphispiza belli belli*), ***Federal Bird of Conservation Concern, California Species of Special Concern.*** The scrub habitats on the off-site grading sites provide suitable nesting habitat for this species. Should this species occur on the site, construction-related activities could result in the loss or abandonment of active nests during that year's nesting season. Depending on the number and extent of

this species' bird nests that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting Bell's sage sparrows to below a level of significance. The Newhall Ranch Program EIR concludes that due to the substantial loss of habitat, and potentially the direct loss of individuals, resulting from buildout of the Specific Plan, impacts to Bell's sage sparrow would be considered unavoidably significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

Western burrowing owl (*Athene cunicularia*), ***Federal Bird of Conservation Concern, California Species of Special Concern.*** This species has not been observed on the project site. However, suitable nesting habitat (i.e., ground squirrel burrows) occurs on the project site. Should this species occur on the site, construction-related activities could result in the loss or abandonment of active burrows. Depending on the number and extent of active burrows on the site that may be disturbed or removed, the loss of active burrows would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting western burrowing owls to below a level of significance. The Newhall Ranch Program EIR concludes that due to the substantial loss of habitat, and potentially the direct loss of individuals resulting from buildout of the Specific Plan, impacts to western burrowing owl would be considered unavoidably significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

Loggerhead shrike (*Lanius ludovicianus*), ***California Species of Special Concern.*** This species has not been observed nesting on the project site during annual bird surveys. However, suitable nesting habitat occurs in association with the grassland and scrub habitats on site, and loggerhead shrike could nest in those areas. Should this species occur on site, construction-related activities could result in the loss or abandonment of active nests. Depending on the number and extent of active nests on the site that may be disturbed or removed, the loss of active nests would be a potentially significant impact. Implementation of proposed Mitigation Measure 4.6-88 would reduce impacts to nesting loggerhead shrikes to below a level of significance. The finding that impacts to loggerhead shrike can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), ***California Species of Special Concern.*** This species has not been observed on the project site. However, suitable habitat occurs on the off-site grading sites in association with the grassland, coastal sage scrub and chaparral vegetation, and San Diego black-tailed jackrabbit could occur in these areas. Should this species occur on site, construction-related activities could result in the direct loss of individual black-tailed jackrabbit. Implementation of proposed Mitigation Measures 4.6-89 and 4.6-98 would reduce the magnitude of impacts to San Diego

black tailed jackrabbit. However, given the amount of potentially occupied habitat to be developed and/or disturbed, direct impacts to this species would still be considered significant. This finding is consistent with the findings of the Newhall Ranch Program EIR that concludes the substantial loss of habitat, and potentially the direct loss if individuals of this species, would be considered an unavoidable significant impact. See **Bio-2, Wildlife Habitat Loss**, for a discussion of project-related impacts to special-status wildlife due to habitat loss.

American badger (*Taxidea taxus*), ***California Species of Special Concern.*** This species has not been observed on the project site; however, suitable habitat occurs on the off-site grading sites in association with the grassland and coastal sage scrub plant communities. Should this species occur on the site, construction-related activities could result in the direct loss of individual American badger. Depending on the number and extent of the species on site that may be disturbed or removed, without mitigation, the loss of American badgers would be a potentially significant impact. Implementation of proposed Mitigation Measures 4.6-89 and 4.6-98 would reduce impacts to the American badger to a less than significant level. Impacts to this species were not addressed by the Newhall Ranch Program EIR.

(iii) Impacts to Special-Status Wildlife Species Occurring Downstream of the Project Site within the SMA/SEA 23

The following special-status wildlife species are known to, or could, occur within the Santa Clara River downstream of the Landmark Village project site: **Santa Ana sucker**, **unarmored threespine stickleback**, **arroyo chub**, **southwestern pond turtle** and **two-striped garter snake**. The *Flood Technical Report for the Landmark Village Project* (PACE 2005) found that there would be no significant changes in water flows, velocities, depth, sedimentation or floodplain and channel conditions downstream of the project site as a result of the proposed project. These hydraulic effects were also found to be insufficient to alter the amount, location and nature of aquatic and riparian habitats in the project area and downstream into Ventura County. The technical analysis further determined that the river would still retain sufficient width to allow natural fluvial processes to continue; consequently the mosaic of habitats in the river that support various sensitive species would be maintained and the population of the species within and immediately adjacent to the river corridor would not be significantly affected. Based on that technical assessment, and the analysis of these species and their habitat described in the PACE 2005 (these conclusions were reached by Entrix based upon the PACE report) report, no significant impacts to downstream populations of these special-status wildlife species are expected to occur.

11.2.9 Bio-9, Sensitive Plant Communities

As discussed in **Section 9.1.2,** four of the plant communities found within the Landmark Village project site are considered sensitive by CDFG: southern willow scrub, southern cottonwood willow riparian forest, valley freshwater marsh, and scalebroom scrub. Impacts to these sensitive plant communities are discussed below.

(i) Southern Willow Scrub

The proposed project would result in the permanent loss of 0.57 acre of southern willow scrub from the project site. An additional 4.62 acres would be temporarily disturbed by bank stabilization and/or haul roads, but would be revegetated following completion of construction. Of the total 5.13 acres of southern willow scrub on the project site, 4.90 acres are within the boundaries of the SMA/SEA 23 (of which 0.44 acre would be permanently developed and 4.46 acres would be temporarily disturbed). Given the biological value of this habitat, and because this plant community is considered sensitive and is under the jurisdiction of the CDFG, the loss of southern willow scrub would be a significant impact. Implementation of RMP Mitigation Measures 4.6-1 through 4.6-26, Newhall Ranch Program EIR Mitigation Measures 4.6-55 and 4.6-63, as well as proposed Mitigation Measure 4.6-87 would reduce impacts to this plant community to below a level of significance. The finding that impacts to southern willow scrub can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

(ii) Southern Cottonwood-Willow Riparian Forest

The proposed project would result in the permanent loss of 8.53 acres of southern cottonwood willow riparian forest from the project site. An additional 10.09 acres would be temporarily disturbed by bank stabilization and/or haul roads, but would be revegetated following completion of construction. Of the total 18.61 acres of southern cottonwood willow riparian forest on the project site, 13.02 acres are within the boundaries of the SMA/SEA 23 (of which 2.94 acres would be permanently developed and 10.09 acres would be temporarily disturbed). Given the biological value of this riparian habitat, and because this plant community is considered sensitive and is under the jurisdiction of the CDFG, the loss of southern cottonwood willow riparian forest would be a significant impact. Implementation of RMP Mitigation Measures 4.6-1 through 4.6-26, Newhall Ranch Program EIR Mitigation Measures 4.6-55 and 4.6-63, as well as proposed Mitigation Measure 4.6-87 would reduce impacts to this plant community to below a level of significance. The finding that impacts to southern cottonwood willow riparian forest can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

(iii) Valley Freshwater Marsh

The proposed project would result in the loss of 0.12 acre of valley freshwater marsh from the project site. An additional 0.91 acre would be temporarily disturbed by bank stabilization and/or haul roads, but would be revegetated following completion of construction. Of the total 1.03 acre of valley freshwater marsh on the project site, 0.98 acre is within the boundaries of the SMA/SEA 23 (of which 0.07 acre would be permanently developed and 0.91 acre would be temporarily disturbed). Given the biological value of this plant community, and because this plant community is considered sensitive and is under the jurisdiction of the CDFG, the loss of valley freshwater marsh is considered to be a significant impact. Implementation of RMP Mitigation Measures 4.6-1 through 4.6-26, as well as the Newhall Ranch Program EIR Mitigation Measure 4.6-63 would, however, reduce impacts to this plant community to a less than significant level. The finding that impacts to valley freshwater marsh can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR.

(iv) Scalebroom Scrub

The proposed project would result in the loss of 5.69 acres of scalebrome from the project site. An additional 3.14 acres of scalebrome scrub would be temporarily disturbed. All of this area is outside of the boundaries of the SMA/SEA 23. Given the biological value of this riparian plant community, and because this plant community is considered sensitive and is under the jurisdiction of the CDFG, the loss of scalebroom scrub is considered to be a significant impact. Implementation of RMP Mitigation Measures 4.6-1 through 4.6-26, Newhall Ranch Program EIR Mitigation Measures 4.6-55 and 4.6-63, as well as proposed Mitigation Measure 4.6-87 would reduce impacts to this plant community to below a level of significance. The finding that impacts to riparian plant communities can be mitigated to below a level of significance is consistent with the findings of the Newhall Ranch Program EIR.

11.2.10 Bio-10, Jurisdictional Resources

The proposed project would result in the permanent fill of 6.26 acres and the temporary disturbance of an additional 10.77 acres of drainages under the jurisdiction of the ACOE (**Figure 17, Impacted Jurisdictional Resources**). Areas to be permanently filled include 1.85 acres of agricultural drains, 2.66 acres within Chiquito Creek, 0.62 acre of seasonal tributaries to Chiquito Creek, 0.55 acre within the Santa Clara River, and 0.58 acre of tributaries to the Santa Clara River. Temporary impacts (resulting from haul routes, utility corridor, and bank stabilization) would occur to 1.47 acres of Chiquito Canyon Creek, 0.23 acre of an agricultural drain, 4.74 acres of the Santa Clara River, 0.49 acre of tributaries to the Santa Clara River, and approximately 3.84 acres of Castaic Creek (Castaic Creek was not delineated in the field; the approximate acreage was estimated using Geographic Information Systems [GIS]).

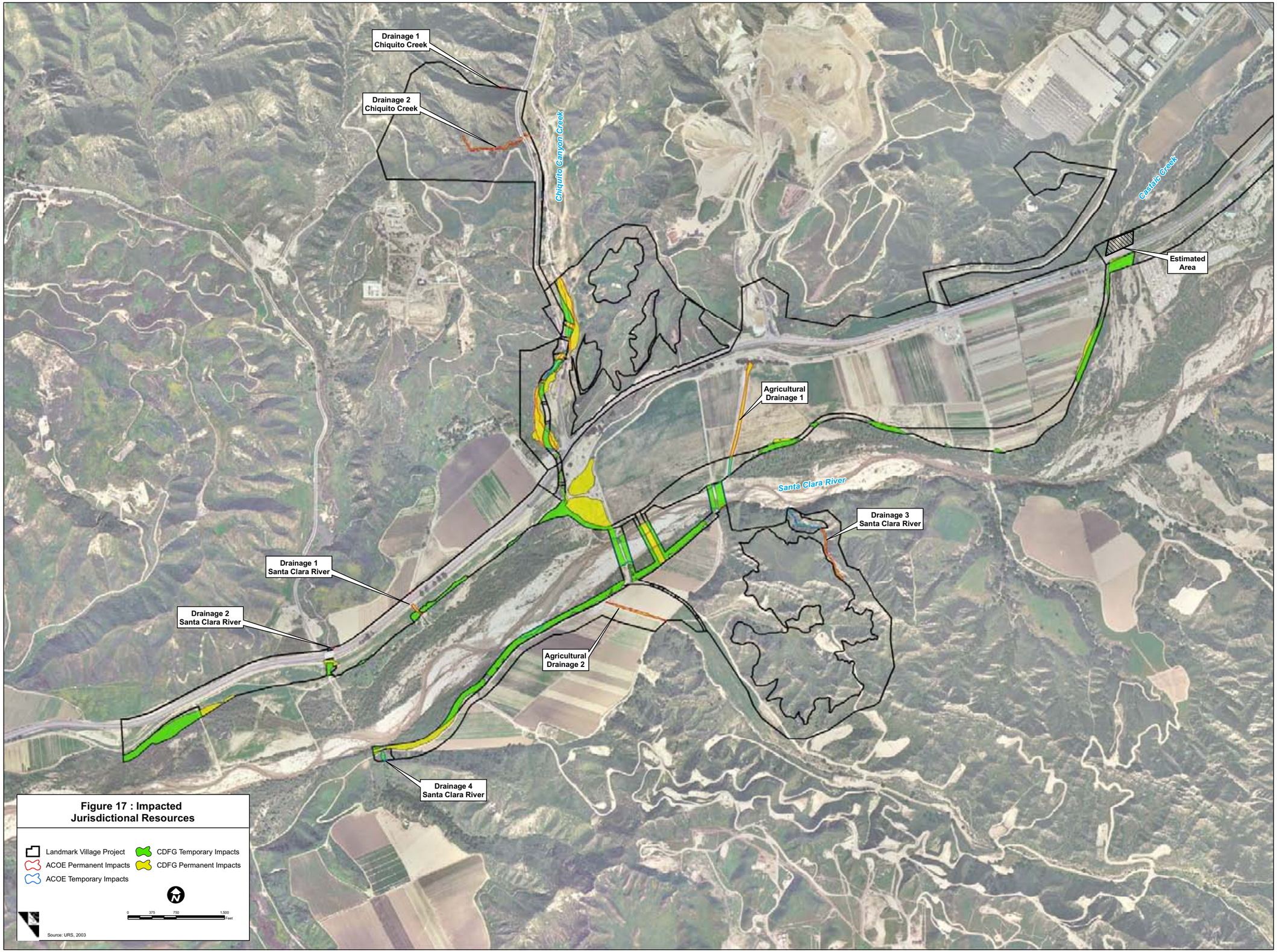

Figure 17 : Impacted Jurisdictional Resources

These areas, as well as 43.82 acres of associated riparian vegetation to be disturbed (**Bio-1** and **Bio-9**), are also under the jurisdiction of CDFG. The fill/removal of these jurisdictional resources would be a significant impact. Implementation of RMP Mitigation Measures 4.6-1 through 4.6-26, Newhall Ranch Program EIR Mitigation Measures 4.6-55 and 4.6-63, as well as proposed Mitigation Measure 4.6-87 would reduce impacts to jurisdictional resources to below a level of significance. The finding that impacts to jurisdictional resources can be reduced to below a level of significance with mitigation is consistent with the findings of the Newhall Ranch Program EIR. As previously described in **Sections 9.3.1** and **9.3.2**, the Landmark Village applicant is seeking approval of a Master 404 Permit from the ACOE and a Master 1600 Agreement from the CDFG for the Newhall Ranch Specific Plan area, including the Landmark Village site. The environmental document is in process at this time and a draft of the EIR/EIS is expected to be released for public review late 2005.

11.3 INDIRECT IMPACTS

Indirect impacts to biological resources would occur in those habitat areas surrounding the development envelope, as well as in remaining habitat areas within the proposed development area, both during and after the completion of the proposed project. Indirect impacts on biological resources as a result of project development on the site can include the following: (1) increased lighting and glare effects on wildlife species in remaining and adjacent open space areas; (2) a potential increase in pesticides, herbicides and pollutants into adjacent drainages, creeks, rivers and wetlands, as a result of landscaping irrigation and stormwater runoff; (3) an increase in non-native plant and wildlife species that are adapted to more urban environments and can out compete native species for available resources, thus reducing the distribution and population of native species; (4) increased human activity and domestic animal presence that can disturb natural habitat areas and displace wildlife populations; and (5) erosion and dust resulting from construction/grading activities.

Indirect impacts associated with the proposed project are not quantifiable, but are reasonably foreseeable. As such, the following discussion identifies expected types of secondary impacts and their relative magnitude, such that decision makers and the general public are aware of the indirect impact potential associated with implementation of the proposed project. This type of analysis is consistent with the requirements of CEQA.

11.3.1 Bio-11, Increased Light and Glare into the SMA/SEA 23

The development of a residential community would increase the number of nighttime light and glare sources on the site over current levels, which are very low to non-existent. Nighttime lighting can disturb

resting and foraging behavior and can potentially alter breeding cycles and nesting behavior. If uncontrolled, such light where proximal to riparian areas associated with the Santa Clara River and Castaic Creek could adversely impact the composition and behavior of the animal species that occur in these areas. Because of the potential disruption to breeding, movement, and foraging behavior of wildlife species, without mitigation, increased nighttime lighting and glare associated with the proposed project is a significant impact. Implementation of Newhall Ranch Program EIR Mitigation Measure 4.6-56 would reduce potential impacts resulting from increased light and glare to below a level of significance.

11.3.2 Bio-12, Landscaping Irrigation and Stormwater Runoff into the SMA/SEA 23

Over-irrigation of landscaped areas, especially when combined with the use of chemicals, could lead to runoff that contains pesticides, herbicides, nitrates and other contaminants. Any runoff that flows into the river corridor containing high levels of nutrients, particularly fertilizers and waste products such as nitrogen and phosphorous, could result in eutrophication (excessive nutrient buildup). This, in turn, could result in a depletion of available oxygen due to increased biological oxygen demand (BOD) and reduce available dissolved oxygen for aquatic organisms. Other chemicals, pesticides and herbicides could also adversely affect aquatic systems. In addition, paved surfaces would contribute runoff into the river corridor during storm events. Depending on the magnitude and frequency of storm events and the overall level of water quality, this runoff could cause increased eutrophication, depleted oxygen levels, long-term build-up of toxic compounds and heavy metals and other adverse effects to biological resources associated with aquatic systems.

Project Design Features (PDFs) incorporated into the project to address water quality and hydrologic impacts include site design, source control, treatment control, and hydromodification control Best Management Practices (BMPs). Stormwater runoff from all urban areas within the proposed project will be routed to bioretention areas, vegetated swales and/or extended detention basin treatment control BMPs.

The effectiveness of these proposed measures to maintain water quality in the Santa Clara River was analyzed by GeoSyntec Consultants.[7] The following summarizes the efficacy of these PDFs in reducing impacts on surface water quality.

Nutrients (Phosphorus and Nitrogen (Nitrate+Nitrite-N and Ammonia-N): MS4 Permit, General Construction Permit, Dewatering General Permit, and Standard Urban Stormwater Mitigation Plan

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7 GeoSyntec Consultants. April 2005. *Landmark Village Water Quality Technical Report*. (**Appendix E**)

(SUSMP)-compliant BMPs will be incorporated into the project to address nutrients in both the construction phase and post-development. Nitrate-nitrogen plus nitrite-nitrogen concentrations and loads are predicted to decrease in the post-developed condition. Total phosphorus concentration is predicted to be below the minimum observed value in the Santa Clara River. Nitrate-N plus nitrite-N and ammonia-N concentrations are predicted to be well below LA Basin Plan objectives and below or in the low range of observed values in the Santa Clara River Reach 7_E. The predicted nutrient concentrations are not expected to cause increased algae growth. On this basis, the impact of the project on nutrients is considered less than significant.

Trace Metals: MS4 Permit, General Construction Permit, General Dewatering Permit, and SUSMP-compliant BMPs will be incorporated into the project to address trace metals in both the construction phase and post-development. The mean loads of dissolved copper and dissolved zinc are predicted to increase with project development, while all trace metal concentrations and the mean load of total lead are predicted to decrease. Mean concentrations of dissolved copper, total lead, and dissolved zinc are below benchmark Basin Plan objectives and California Toxics Rule criteria. Cadmium is not expected to be present in runoff discharges from the project. On this basis, the impact of the project on trace metals is considered less than significant.

Pesticides: Pesticides in runoff may or may not increase with development as a result of landscape applications. Proposed pesticide management practices including source control, removal with sediments in infiltration basins, and advanced irrigation controls in compliance with the requirements of the MS4 Permit and the SUSMP will minimize the presence of pesticides in runoff. Final site stabilization will limit mobility of legacy pesticides that may be present in pre-development conditions. On this basis, the impact of pesticides is considered less than significant.

Pathogens: Pathogen sources include both natural and anthropogenic sources. The natural sources include bird and mammal excrement. Anthropogenic sources include leaking septic and sewer systems and pet wastes. A reduction in open space within the project area will reduce the bacteria produced by wildlife. The project will not include septic systems and the sewer system will be designed to current standards, which minimizes the potential for leaks. Thus pet wastes are the primary source of concern. The PDFs will include source controls and treatment controls, which in combination should help to reduce pathogen indicator levels in stormwater runoff. On this basis, the projects impact on pathogen and pathogen indicators is considered less than significant.

Hydrocarbons: Hydrocarbon concentrations will likely increase with development because of vehicular emissions and leaks. In stormwater runoff hydrocarbons are often associated with soot particles that can

combine with other solids in the runoff. Such materials are subject to treatment in the proposed infiltration basins and vegetated swales. Source control BMPs incorporated in compliance with the MS4 Permit, the General Construction Permit, and the SUSMP will also minimize the presence of hydrocarbons in runoff. On this basis, the impact of the project on hydrocarbons is considered less than significant.

Chloride: MS4 Permit, General Construction Permit, Dewatering General Permit, and SUSMP-compliant BMPs will be incorporated into the project to address chloride in both the construction phase and post-development. The mean concentration and load of chloride is predicted to decrease with development, the predicted concentration is well below the LA Basin Plan objective and is near the low range of observed values in the Santa Clara River Reach 7_E. On this basis, the impact of the project on chloride is considered less than significant.

Methylene Blue Activated Substances (MBAS): The presence of soap in runoff from the project will be controlled through the source control PDFs, including a public education program on residential and charity car washing. Other sources of MBAS, such as cross connections between sanitary and storm sewers, are unlikely given modern sanitary sewer installation methods and inspection and maintenance practices. Therefore, MBAS are not expected to significantly impact the receiving waters of the proposed project.

Bioaccumulation: In the literature, the primary pollutants that are of concern with regard to bioaccumulation are mercury and selenium. However, selenium and mercury are not of concern in this watershed, so bioaccumulation of selenium and mercury is also not expected. On this basis, the potential for bioaccumulation in the project PDFs or in the Santa Clara River and adverse effects on waterfowl and other species is considered less than significant.

11.3.3 Bio-13, Increase in Populations of Non-Native Plant and Wildlife Species

After project completion, a number of non-native plant species that are more adapted to urban environments could increase in population and potentially displace native species within the riparian corridor because of the ability of non-natives to compete more effectively for resources. It is unknown to what degree non-native plant species will displace native species in adjacent habitat areas. However, because non-native and exotic plants are commonly included in landscaping plans of both common areas and private lots of new development projects, it can be reasonably concluded that project development could result in identifiable increases in non-native and/or exotic plant populations.

In particular, these plant species are often more adapted to a wider variety of growing conditions and can out-compete native plant populations for available nutrients, prime growing locations and other resources. Because these plants reproduce so quickly and in such large amounts, these species can quickly replace many native plant populations, resulting in lower species diversity, loss of suitable breeding and/or nesting habitat for common and special-status wildlife species, changes to the riparian ecosystem and overall reductions in habitat values. Therefore, the impact on native biological resources as a result of increased non-native plant species is considered potentially significant. Implementation of proposed Mitigation Measure 4.6-91 would reduce the magnitude of impacts resulting from an increased non-native population to below a level of significance.

Urban development also tends to attract wildlife species that are more typical of, and more adaptable to, urban settings, including house sparrows, European starlings, rock doves, brown-headed cowbirds, American crows, ravens, striped skunks, opossum, red fox, raccoons and Norway rats. An increase in meso-predators (i.e., skunk, opossum, fox) in an area can adversely impact native rodent and bird populations. Additionally, a number of native species are not adapted to urban development and their populations tend to decrease in the vicinity of residential or recreational developments.

Developed areas also attract and encourage non-native Argentine ants. These ants have the potential to negatively impact native ant populations, which serve as secondary pollinators and seed dispersers of many native flower species. Additionally, as coast horned lizard primarily feed on native ants, the reduction of native ant populations due to the introduction of Argentine ants could adversely affect the local coast horned lizard population. As discussed in the Newhall Ranch Program EIR, wildlife species typical of an urban environment currently occur in the area. Accordingly, development of the proposed project would further exacerbate an already adverse condition. Therefore, the impact on native biological resources as a result of increased non-native animal species is considered significant. Implementation of proposed Mitigation Measures 4.6-92, 4.6-93 and 4.6-95 would reduce the magnitude of the project's contribution towards an already adverse condition to below a level of significance.

11.3.4 Bio-14, Increased Human and Domestic Animal Presence Within the SMA/SEA 23

The proposed project would increase the number of people living and recreating adjacent to the Santa Clara River. The effect of this increase in human population would be the potential for increased human disturbances to, and ongoing degradation of, adjacent riparian habitats associated with the Santa Clara River. Increased recreation and other human activity along proposed trails and unauthorized entry into the riparian area could result in increased noise disturbances to wildlife (especially during the breeding season of birds) which can result in nest abandonment; the harassment and/or capture of slower moving species, including certain reptiles and amphibians; the displacement of other wildlife species; an increase

in the amount of refuse and pollutants in the area; compaction of soils; and trampling of ground-dwelling flora and fauna.

Increased use of the project site by future residents of Landmark Village would also result in a corresponding increase in use of the area by domestic animals. Dogs can disturb nesting or roosting sites and disrupt the normal foraging activities of wildlife in adjacent habitat areas. Should this activity occur frequently, and over a long time period, these disturbances may have a long-term effect on the behavior of both common and special-status species and can result in their extirpation from the area. Feral cats and house cats can cause substantial damage to the species composition of natural areas, including the populations of special-status species, through predation. Implementation of RMP Mitigation Measures 4.6-17 through 4.6-19 would reduce the magnitude of impacts related to increased human and domestic animal presence. However, consistent with the findings of the Newhall Ranch Program EIR, impacts caused by increased human and domestic animal presence would still be considered significant.

11.3.5 Bio-15, Construction and Grading Activities

Construction and grading activities associated with project implementation that are proposed adjacent to or within the Santa Clara River ecosystem could adversely affect sensitive vegetation and wildlife within portions of the ecosystem not directly affected. These activities can result in the following impacts: (1) siltation and erosion into creek and river drainages that could adversely affect fish spawning and movement; (2) excessive dust accumulation on vegetation that could result in the degradation or loss of some plant species; and (3) soil compaction around remaining trees. These impacts will be minimized through implementation of construction BMPs that will meet or exceed measures required by the General Construction Permit, as well as BMPs that control the other potential construction-related pollutants (PAHs, metals). A Stormwater Pollution and Prevention Plan (SWPPP) will be developed as required by, and in compliance with, the General Construction Permit and Los Angeles County Standard Conditions. Erosion control BMPs including, but not limited to, hydro-mulch, erosion control blankets, and energy dissipaters will be implemented to prevent erosion; whereas, sediment controls, including but not limited to silt fence, sedimentation ponds, and secondary containment on stockpiles will be implemented to trap sediment once it has been mobilized. On this basis, the construction-related impacts of the project are considered less than significant.

11.4 CUMULATIVE IMPACTS

11.4.1 Proposed and Reasonably Foreseeable Projects

The Landmark Village project is a component of the Newhall Ranch Specific Plan. The Specific Plan will guide the long-term development of the 11,963-acre Newhall Ranch community, comprising a broad range of residential, mixed-use, and non-residential land uses developed within five village areas. Other, proposed and reasonably foreseeable projects are described below. Where the potential impacts are known, the impacts likely to be associated with these projects are first identified. The potential for these impacts to combine with similar impacts due to the proposed project is also evaluated. This list of projects is not intended to include all projects that are proposed in the project region. Instead, the analysis focuses on those projects that support or would potentially affect similar plant communities, jurisdictional resources, and special-status plant and animal species that occur on the Landmark Village project site. In particular, those projects that are adjacent to or that otherwise may affect resources associated with the Santa Clara River were included.

(i) Valencia Commerce Center

This project consists of a light industrial and commercial development over 1,500 acres on undeveloped farmlands north of the Newhall Ranch Specific Plan site and SR-126, and west of I-5. Castaic Creek traverses the site. This project was approved by the County in 1992 and a considerable portion of the site is now developed. A 404 Permit was issued for this project by the ACOE to line the existing banks with gunite bank protection. Castaic Creek contains dense riparian woodland and supports the least Bell's vireo and arroyo toad. As such, construction of the Valencia Commerce Center and the development projects associated with the proposed Valencia Company 404 Permit could cause the following potentially significant cumulative impacts: (1) loss of riparian habitat from the study area; (2) disturbance of riparian wildlife due to the proximity of urban development; (3) potential degradation of water quality in the Santa Clara River due to urban stormwater runoff; (4) permanent loss of prime farmlands; (5) temporary and permanent disturbance to habitat for the least Bell's vireo; (6) impacts to mariposa lily, everlasting, and San Fernando Valley spineflower; and (7) modification of visual qualities due to urban development, bank protection, and bridges.

(ii) West Creek Project

The proposed West Creek project is located on the west side of San Francisquito Creek, north of Newhall Ranch Road and south of the Copperhill Road Bridge. The proposed project consists of a maximum total

of 2,545 residential units, along with a total of 180,000 square feet of neighborhood serving commercial uses, an elementary school and other related development. Circulation will be provided by a series of internal collector roadways that connect to the previously constructed extension of Copper Hill Drive, a public street that represents the primary roadway providing ingress and egress to the site. Private recreational facilities will be provided in the central portion of the project site and a network of hiking/biking trails will extend both throughout the project site and along San Francisquito Creek. Buried bank stabilization has been installed along the west side of San Francisquito Creek and the Decoro Drive Bridge over the creek has been completed. The project site lies partially within SEA 19.

Development of the West Creek project and the other projects along San Francisquito Creek could combine to cause the following potentially significant cumulative impacts: (1) loss of riparian habitat along the margins of the creek; (2) disturbance of riparian wildlife breeding, foraging, and movement due to the proximity of urban development and short-term construction activities; (3) potential degradation of water quality in San Francisquito Creek due to urban stormwater runoff; (4) localized alteration in channel velocities in areas where the existing channel is narrowed; (5) loss of native upland habitats due to land development; (6) permanent loss of prime farmlands; (7) modification of visual qualities due to urban development, bank protection, and bridges; and (8) potential disturbance to habitat for the unarmored threespine stickleback.

(iii) Entrada

The approximately 820-acre project site is located within unincorporated Los Angeles County in the Santa Clarita Valley. More specifically the project site is located directly west of I-5, both north and south of Magic Mountain Parkway. The project applicant proposes to develop the property with up to 3,300 residential units and 3.1 million square feet of commercial floor area. Approximately 48 percent of the site would be retained as open space. Bank stabilization along a portion of the Santa Clara River would be constructed in conjunction with the project. Construction and development of this project could cause potentially significant cumulative impacts to mariposa lily, everlasting, and San Fernando Valley spineflower, and valley oak savannah.

(iv) Tesoro del Valle (Upper San Francisquito Creek)

The approved project presently under construction is a master planned community of about 2,500 units on a 1,795-acre site on the west side of San Francisquito Creek. When completed, this development would include single- and multi-unit residences, commercial sites, schools, parks, and a fire station. About 1,002 acres of the site would remain in open space, and about 672 acres would remain in a natural undeveloped condition. The project required and received a General Plan Amendment from Los Angeles County, a CUP, and other local approvals. The project requires substantial grading of hills and the removal of upland habitats and numerous oak trees. The project encroaches into San Francisquito Creek at two locations. About 3.5 acres of the creek will be filled for slopes and a bridge crossing. The lower slopes will contain rip-rap bank protection. Runoff from the project will be directed to water quality basins where aquatic vegetation will be maintained to uptake urban stormwater pollutants before the stormwater is discharged into the creek. The project site lies partially within SEA 19.

Development of the Tesoro del Valle and the projects along San Francisquito Creek associated with the approved Valencia Company 404 Permit could combine to cause the following potentially significant cumulative impacts: (1) loss of riparian habitat along the margins of the creek; (2) disturbance of riparian wildlife breeding, foraging, and movement due to the proximity of urban development and short-term construction activities; (3) potential degradation of water quality in San Francisquito Creek due to urban stormwater runoff; (4) localized alteration in channel velocities in areas where the existing channel is narrowed; (5) loss of native upland habitats due to land development; (6) permanent loss of prime farmlands; (7) modification of visual qualities due to urban development, bank protection, and bridges; and (8) potential disturbance to habitat for the unarmored threespine stickleback.

(v) Cross Valley Connector (Newhall Ranch Road including the Newhall Ranch Road/Golden Valley Road Bridge)

This project would involve the extension of Newhall Ranch Road, including the Newhall Ranch Road/Golden Valley Road Bridge. Newhall Ranch Road would be extended by approximately 2 miles to the east of Bouquet Canyon Road including a bridge over the Santa Clara River connecting with Golden Valley Road. The proposed typical section of the alignment would include a six-lane roadway of approximately 120 feet in width, with a 14-foot median island and pedestrian and bicycle lanes. The proposed Golden Valley Road segment would require the construction of a bridge across the Santa Clara River and would traverse undeveloped open space (e.g., vacant lot, natural riverbed, scrub habitat) parallel to an overhead power line corridor. The proposed roadway is included as Major Arterial Highways in the City's General Plan.

(vi) North Valencia Specific Plan No. I (Industrial Park)

While a majority of the North Valencia Specific Plan, located approximately 2 miles east (upstream) of the Newhall Ranch Specific Plan site and adjacent to the north and south side of the Santa Clara River and east and west side of San Francisquito Creek, is already constructed, a relatively small portion remains to be built. The remaining portion of the project would result in the construction of 167,000 square feet of industrial/business park on 7.7 acres. The Business Park designation is intended for industrial type uses per the North Valencia No. I Annexation Specific Plan. These uses will allow general industrial, research and development, limited retail/commercial, warehousing and office use related to these uses. Primary access to the site is through Avenue Tibbitts, Anza Drive, and Avenue Hopkins.

(vii) North Valencia Specific Plan No. II

This approved project, located approximately 2 miles east (upstream) of the Newhall Ranch Specific Plan on the east side of San Francisquito Creek, entailed the annexation of 596.2 acres of land and the entitlement to develop the undeveloped portion of the annexation area (391.2 acres). Approximately 205 acres of this area is already developed with commercial and industrial uses. The remaining portions of the Specific Plan area are presently under development. The project approvals allow the developer to construct 1,900 dwelling units (1,400 single-family detached, 500 multi-family attached), 210,000 square feet of commercial/retail uses, a 15.9-acre community park, 20-acre school site, 4.1 acres of private neighborhood parks, 93.4 acres of natural open space and over 9 miles of trails and paseos. The 596.2-acre project includes approximately 391.2 acres of Specific Plan area and 205 acres of existing industrial and commercial development in the Valencia Industrial Center. The SEA in the project area is the San Francisquito Creek SEA (SEA 19). The General Plan states that, "…[t]his area was designated as an SEA primarily because of the threat of loss of suitable habitat for the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni)*, a federally and state listed Endangered species."

The project is a diverse and balanced mix of land uses ranging from commercial retail to high density multi-family and low to medium density single-family residential uses. These uses provide land uses which support the local vicinity and region (e.g., new housing would be provided to support existing and new employment opportunities expected to occur in the Santa Clarita Valley); commercial land uses which provide services for new residents; neighborhood parks and a school site to provide local recreational and educational support for new and existing residents. The trail system will serve the recreational needs of both a local and regional area. The creek area on the site is devoted to conservation (approximately 93.4 acres of the 596.2-acre site). This area, termed the San Francisquito Creek Conservation Area, is intended to respond to the City's desire to maintain the creek and SEA as an area devoted to the protection and preservation of important biological resources. Nevertheless, impacts on

riparian resources and the riparian ecosystem and impacts on SEA 19 are considered cumulatively significant. Also, human and domestic animal use of riparian and upland habitat areas is expected to continue to occur as a result of project implementation and, therefore, will remain cumulatively significant.

(viii) Riverpark

The Newhall Land and Farming Company, will develop the Riverpark (Panhandle) project on a 695.4-acre site in the City of Santa Clarita in Los Angeles County. This project was approved by the City of Santa Clarita in May 2005. The project site is located in the central part of the City at the eastern terminus of Newhall Ranch Road, east of Bouquet Canyon Road between the Castaic Lake Water Agency (CLWA) property and Soledad Canyon Road.

The project includes the development of 695.4 acres of land for single- and multi-family uses and commercial uses. The entitlement, as approved by the City, allows the applicant to construct a residential community with 1,089 dwelling units, a maximum of 16,000 square feet of commercial uses, a trail system (Santa Clara River Trail, Newhall Ranch Road and Santa Clarita Parkway Class I trails, and trail connections from the interior planning areas), and a 29-acre active/passive park along the Santa Clara River. The project would also provide for utility easements (electric, water, wastewater, etc.), public street rights-of-way, and roughly 707 acres of City dedicated on and off- site open space area, including significant portions of the Santa Clara River. Buildout of the project necessitates the extension of Newhall Ranch Road, (full grading, four to six lanes) including the Newhall Ranch Road/Golden Valley Road Bridge over the Santa Clara River, to the Golden Valley Road/Soledad Canyon Road flyover. A portion of Newhall Ranch Road is located off site on property owned by CLWA. The project would include the construction of a portion of Santa Clarita Parkway (full grading, four vehicle lanes, Class I trail) from Newhall Ranch Road south for approximately 1,500 feet. The project will not include construction of the Santa Clarita Parkway Bridge over the Santa Clara River or its connection to Soledad Canyon Road.

The project applicant received approval of General Plan Amendment 02-002, Zone Change 02-002, Vesting Tentative Tract Map (VTTM) No. 53425, CUP No. 02-009, Hillside Development Application 02-003 including an Innovative Application, Oak Tree Permit 02-025 and Adjustment No. 02-010. Additional actions, such as grading and building plan review, would be required by the City to permit grading and construction activities on the site.

(ix) Bouquet Canyon Bridge Widening

This project would result in the widening of the Bouquet Canyon Road Bridge over the Santa Clara River to eight lanes, which would add one lane in each direction. The project consists of design and construction of roadway improvements, including the median, the relocation of a 36-inch effluent line on the south side of the bridge, the relocation of three sewer siphons on the east side of the bridge, a bike lane undercrossing on the north end of the bridge and a bike ramp from the bridge to the bike lane undercrossing on the north end of the bridge. Impacts associated with the project include hydrological and biological impacts associated with construction activities.

(x) Whittaker – Bermite (Porta Bella Project)

Specific Plan No. 91-001, proposes a comprehensive plan for development of a 996-acre site with approximately 1,678 single-family homes and 1,560 multi-family units on 399 acres. Approximately 91 acres is planned for commercial and industrial uses, 14 acres for institutional uses, and 58 acres consisting of streets. The remaining 434 acres would be devoted to natural open space and recreational uses. Traffic/transportation, geological, air quality and biological resource impacts could occur with project implementation.

(xi) Synergy Project

This project is proposed in the City of Santa Clarita and is located at terminus of Ermine Road, adjacent to the Riverpark project site. The project site is 208 acres in size and the project would consist of 916 multi-family and 95 single-family dwelling units. Hydrology, transportation/access, biological resources, water quality and air quality are expected to be potentially significant impacts.

(xii) Tick Canyon

This project is proposed to occur at the northern terminus of Shadow Pines Boulevard, outside of the present City limits. It is proposed to consist of 492 single-family units and a 34-acre park site on 500 acres. Traffic/transportation, geological, air quality and biological resource impacts could occur with project implementation. An EIR is presently being prepared for this project.

(xiii) Bee Canyon

The Bee Canyon project is proposed on a 211-acre parcel of land located between the Transit Mix project indicated above and State Route 14 (SR-14), easterly of Soledad Canyon Road. The applicant is requesting 556 single-family modular units, and the project would require the lengthy extension of public utilities. Traffic/transportation, geological, air quality and biological resource impacts could occur with project implementation. An EIR has yet to be completed for this project.

(xiv) Tract 42670

This project consists of a mixed commercial/industrial project to be located along Golden Valley Road in the center of the City of Santa Clarita. The 220-acre site would be developed with up to six million square feet of buildings. This project has been approved by the City and is under construction. Transportation/access and air quality are potential impacts associated with the project.

(xv) Fair Oaks Ranch

The Fair Oaks project (Tentative Tract Map No. 52833) involves the construction of 1,033 residential units on 602 acres just outside the eastern boundary of the City of Santa Clarita. Phase II of the Fair Oaks Ranch development involves the construction of 738 single-family homes, 336 multi-family dwellings, 153 luxury apartments, a 6-acre public park, and dedication of 321 acres of open space just outside the eastern boundary of the City of Santa Clarita. Traffic/transportation, air quality and biological resource impacts could occur with project implementation.

(xvi) Santa Clara River Enhancement and Management Plan

In 1994, a multi-agency committee formally initiated the Santa Clara River Enhancement and Management Plan. The committee consists of various parties and "stakeholders" along the river, including federal, state, and local agencies; water districts; farmers; property owners; and environmental organizations. The plan is designed to provide information on the land use, governmental, and resource conflicts along the river and its 500-year floodplain, extending from near Acton to the Pacific Ocean. Plan preparation is directed by a 26-member Project Steering Committee consisting of representatives of the counties, communities, state and federal agencies, property owners, aggregate producers, water agencies and Friends of the Santa Clara River. The Steering Committee began by identifying the river's critical issue areas. Reports were developed by subcommittees covering biology, water resources, flood control, agriculture, aggregate mining, and recreation that provide background information, goals and

recommendations for the river on the various issue areas. A series of computer-based maps covering the entire river were produced, and have been used in a GIS overlay process to identify conflicts and opportunities, and to facilitate decisions regarding uses of the river floodplain. The Steering Committee, in early 1999, approved a set of river-wide and reach-by-reach recommendations which are to be incorporated into the plan. A draft plan was completed in January 2004 and is presently under review.

(xvii) Gate King Project

The applicant is proposing to subdivide a 584-acre site into 60 lots and is requesting General Plan Amendments to change the land use designations in several areas of the site. The site is situated in the southern portion of Santa Clarita, within the community of Newhall, west of SR-14 and Sierra Highway and south of San Fernando Road. The proposal involves amending the land use designation on about 223 acres, or about 38 percent of the site. The proposed changes would eliminate the Residential (RE) and Commercial (CC) designations from the site, and would increase the area designated Industrial Commercial (IC) from 337.5 acres to about 344 acres. The area designated open space (OS) would increase from 93.2 acres to about 240 acres. The project site includes an estimated 10,680 live oaks and an additional 1,041 oaks that are either dead or have experienced severe fire damage. The proposed development would directly remove 1,000 oaks, or about 9 percent of the total number of oaks on site. Oaks to be removed include 696 coast live oaks and 304 scrub oaks. The 696 coast live oaks to be directly removed do not include 64 trees that were previously removed without City oak tree removal permits. In addition to the oaks that would be directly removed by grading, 336 oaks, or about 3 percent of the site total, could be indirectly affected by site grading and development because of their proximity to areas proposed for grading.

(xviii) Transit Mix Soledad Canyon Mine

Transit Mix, Inc. has proposed a new aggregate mine for a hillside at the entrance to Soledad Canyon. The surface mine would encompass about 300 acres on mostly private land. A separate EIR and EIS were prepared by the Bureau of Land Management and Los Angeles County Department of Regional Planning. The project would result in significant impacts to upland habitats.

Use of groundwater at the mine site could affect the amount of surface water at the mouth of Soledad Canyon where a population of the unarmored threespine stickleback is present. A long-term significant impact to this species is not anticipated because the applicant has agreed to a continuous water quality and depth-monitoring program designed to detect and prevent any adverse impacts from groundwater pumping.

(xix) Los Angeles County Sanitation Districts' Facilities Plan

Most wastewater generated within the Santa Clarita Valley is treated at two existing WRPs that are operated by the County Sanitation Districts of Los Angeles County (CSDLAC). These two treatment facilities, the Saugus WRP (District 26) located at 26200 Springbrook Avenue in Saugus, and the Valencia WRP (District 32), located at 28185 The Old Road in Valencia have been interconnected to form a regional treatment system known as the Santa Clarita Valley Joint Sewerage System (SCVJSS). The relationship between the two districts was established through a joint powers agreement that created the regional treatment system and permits the Valencia WRP to accept flows that exceed the capacity of the Saugus WRP. These two facilities provide primary, secondary and tertiary treatment. The SCVJSS has a combined permitted treatment capacity of 19.1 mgd and treated an average of 18.1 mgd.[8] Existing facilities can be expanded to handle a daily capacity of 34.1 mgd, which is sufficient to meet demand up until 2015.[9]

The CSDLAC has prepared a Facilities Plan, with a horizon year of 2015, for the Santa Clarita Valley Joint Sewerage System and a Draft EIR. The Facilities Plan estimates future wastewater generation for the probable future service area of County Sanitation Districts 26 and 32 in order to anticipate future treatment capacity and wastewater conveyance needs. According to CSDLAC estimates, total flows projected from the Santa Clarita Valley in 2015, exclusive of Newhall Ranch, would be 34.1 mgd. This projection is based upon Southern California Association of Governments (SCAG) 96 population projections exclusive of Newhall Ranch. As a result of this finding, CSDLAC proposed to incrementally expand the treatment facilities to meet future needs in two expansions to a total of 34.1 mgd.[10] This two-phase expansion plan, which would increase treatment capacity by approximately 15 mgd, was recently approved. The first phase would expand treatment capacity by approximately 9 mgd, or approximately a 47 percent increase over existing capacity. This expansion, when complete, will meet the expected wastewater treatment demand through 2010. The second phase, would increase treatment capacity an additional 6 mgd.

The proposed facilities plan is not expected to result in any significant impacts beyond localized and temporary impacts due to physical improvements to the systems. Hence, the potential for significant cumulative impacts with the proposed project is considered very low.

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8 Written correspondence from the County Sanitation Districts of Los Angeles County, March 29, 2004.
9 Written correspondence from the County Sanitation Districts of Los Angeles County, October 1, 2002.
10 Ibid.

(xx) Castaic Lake Water Agency Reclaimed Water Master Plan

CLWA has prepared a draft Reclaimed Water Master Plan (1993) as part of their plan to increase the amount and reliability of the overall water supply. In October 2004, CLWA began CEQA analysis of the *Recycled Water Master Plan* (2002). This analysis will result in a Program Environmental Impact Report covering the various options for a recycled water system outlined in the Master Plan. A Notice of Preparation was released for public review in April 2005. The project would use effluent from County Sanitation Districts of Los Angeles' two local wastewater treatment plants (Saugus and Valencia). Treated wastewater would be diverted from discharge to the river and instead, conveyed by pipelines to customers of reclaimed water such as golf courses, landscaped areas, and certain industrial uses. At this time, CLWA has approval from the Regional Board and Sanitation Districts to reclaim up to 1,700 acre-feet per year. The Master Plan indicates that up to 10,000 acre-feet per year may be feasibly reclaimed and used in the study area in the next 10 years.

Diverting effluent from the river could reduce surface flows, groundwater recharge, and habitat for the unarmored threespine stickleback and other sensitive aquatic species. The significance of this impact is unknown pending further environmental studies. However, it is likely that diversion from the river will only offset the past, present, and future increases in imported water use in the region that result in steadily increasing discharges of treated wastewater into the river. Hence, the effects on surface water, groundwater, and aquatic habitat may be negligible. To the extent that this conclusion is supported by future studies, no significant cumulative impact is anticipated with the proposed project.

11.4.2 Cumulative Development Impact Analysis

Development in the region has been cumulatively reducing the amount of open area and extent of sensitive habitats, and has been constricting wildlife movement. This trend has been occurring in the region since the early 1950s. Major open areas that remain undeveloped include the Angeles National Forest and Los Padres National Forest. Several large development projects are proposed for the Los Angeles/Ventura County region, including the Newhall Ranch Specific Plan.

The Newhall Ranch Specific Plan will permanently convert approximately 5,132 acres of land from a largely natural, albeit partially disturbed, habitat condition, to that of a suburban/urban environment and, at the same time, dedicate 6,170 acres (51 percent of the total Specific Plan area) in the Santa Clara River Corridor and the Santa Susana Mountains as open space. That conversion, when added to all the other such conversions of open area that are proposed, will permanently decrease the amount of land available for natural habitats and the flora and fauna that inhabit them. In some cases, specific natural habitats and plant and animal species occur in relative abundance despite the amount of development

that is on the horizon; however, other habitat and species are not as abundant. In these latter cases, incremental development has been contributing to habitat loss.

When viewed individually, it may be possible for each of the projects to mitigate potential project-specific significant impacts through the implementation of habitat replacement programs and the requirements of the regulatory processes to which each of the projects may be subject (e.g., ACOE Section 404 permit process, California Fish and Game Code 1602 permit process, etc.). However, neither implementation of the Newhall Ranch Specific Plan (including the Landmark Village project), nor any other similar large-scale project proposed on the edge of the existing urban environment, can mitigate from a biological perspective the permanent conversion of large blocks of open space area and its associated plant and wildlife habitat. For this reason, the cumulative impacts identified above are considered to be a significant, unavoidable impact.

12.0 PROJECT COMPATIBILITY WITH RIVER CORRIDOR SMA/SEA 23

As stated above, as part of the project approvals for the Newhall Ranch Specific Plan, the Board of Supervisors previously adopted a program-level SEA CUP No. 94-087-(5). SEA CUP No. 94-087-(5) approved: (a) SEA 23 boundary adjustments; and (b) Specific Plan development within the boundaries of the existing SEA 23.

In approving SEA CUP No. 94-087-(5), the Board found that the SEA boundary adjustments were consistent with General Plan policies requiring the protection of natural resources within SEAs. The then existing SEA 23 boundary on the Specific Plan site was approximately 1,298 acres in size. Under the approved Specific Plan, the SEA 23 boundaries were reduced to 975 acres, or a net reduction of 315 acres. Of the 315 net acres, 309 acres of agricultural/disturbed land were removed from the existing boundaries of SEA 23 to allow for development. The Board found that development on agricultural/disturbed land posed no direct impacts to the sensitive biological resources found within SEA 23. The Board also approved removal for development of 1 acre of sensitive riparian habitat from the existing SEA 23 boundary under the Specific Plan. The Board found that redesignating 1 acre of sensitive habitat for development would not affect the County's ability to preserve the existing SEA 23 in a viable and natural condition.[11]

As to Specific Plan development within the boundaries of the existing SEA 23, in approving SEA CUP No. 94-087-(5), the Board of Supervisors has already determined that such development conforms with the General Plan's six SEA "design compatibility criteria." The approved development included three bridge crossings (e.g., Long Canyon Road Bridge), trails, bank stabilization and other improvements.

As part of the Landmark project approvals, a project-level SEA CUP is now required to authorize project-specific development within the boundaries of the adopted River Corridor SMA/SEA 23 in order to implement the Landmark Village project. The project-specific development proposed within the adopted River Corridor SMA/SEA 23 is as follows: (a) Long Canyon Road Bridge; (b) bank stabilization; (c) a portion of the previously approved regional river trail, and a scenic vista path; (d) underground utility corridor; (e) storm drain outfalls and associated energy dissipaters; (f) riparian mitigation sites; and (g) off-site transport of materials associated with grading. While not a part of the Landmark Village project, land will be preserved on the south side of SR-126 through the Specific Plan site and the Landmark

11 See, Findings of the Board of Supervisors and Order, Conditional Use Permit No. 98-087-(5), adopted on May 27, 2003, along with the Newhall Ranch Revised Additional Analysis (SCH No. 1995011015), Volume VIII, May 2003, Section 2.4, SEA General Plan Consistency, pp. 2.4-14–2.4-39.

Village tract map site for potential future use as a train/light rail right of way. Portions of this area are located within the River Corridor SMA/SEA 23 where it crosses Castaic Creek and to the west of the tract map site along SR-126.

Presented below is a description of the six design compatibility criteria, along with a summary of the Specific Plan's conformity with such criteria, as well as Landmark Village's conformity with such criteria at the project-level. Based on this analysis, the project's proposed development within the adopted SMA/SEA 23 is consistent with both the adopted Specific Plan and the approved program-level SEA CUP No. 98-087-(5).

1. That the requested development is designed to be highly compatible with the biotic resources present, including the setting aside of appropriate and sufficient undisturbed areas.

Specific Plan Summary

The County's Board of Supervisors already found that the Specific Plan and SEA CUP No. 94-087-(5) met Design Compatibility Criterion No. 1, above. In summary, the Board found that the Specific Plan is considered highly compatible with the biotic resources present within the boundaries of the SEA 23 for the following reasons:

(a) The Specific Plan set aside appropriate and sufficient undisturbed sensitive habitat areas within the existing boundaries of SEA 23;

(b) The Specific Plan retained SEA 23 in a largely natural state;

(c) Only a relatively small amount of sensitive habitat (i.e., 1 acre, or 0.08 percent of the existing SEA) was redesignated for non-residential land uses;

(d) The impacted areas would be fully mitigated;

(e) The river would still be sufficiently wide (and in certain locations widened) to accommodate the County's Capital Flood and still retain the sensitive riparian vegetation;

(f) Winter storm runoff would still continue to open its own channels through the river vegetation, flowing in a natural, non-invasive manner and preserve the meandering characteristics of the streambed;

(g) The tributary canyons and bluffs on the south side of the river would still be preserved and provide an additional 444 acres (including 415 acres of undisturbed land), which would be dedicated to open space areas adjacent to the river; and

(h) Due to implementation of the Specific Plan, the amount of sensitive riparian habitat found in the existing SEA 23 would increase by approximately 5 acres and an additional 192 acres of additional sensitive habitat areas adjacent to the SEA 23 would be permanently preserved.

The Newhall Ranch Revised Additional Analysis, Volume VIII, May 2003, Section 2.3, Floodplain Modifications, also addressed potential impacts due to channelization and bank hardening. Based on that analysis, the Board of Supervisors found that no significant increases in velocity, erosion or sedimentation would occur in the river; and, therefore, biotic resources present within the existing boundaries of SEA 23 would not be significantly impacted.

Landmark Village Summary

At the project level, the Landmark Village development within the boundaries of the adopted SMA/SEA 23 is designed to be highly compatible with biotic resources present within that corridor, including setting aside an appropriate and sufficient amount of undisturbed area, consistent with the approved Specific Plan. This proposed development includes the approved Long Canyon Road Bridge, with a proposed span of 1,000 LF, and 11 supporting piers within the river corridor. Bridge abutments are approximately 500 LF of river length consisting of reinforced concrete transitioning to soil cement through 50 LF of river length of rip-rap. The project proposes buried soil cement bank protection along the river and Castaic Creek adjacent to and downstream of the project site. In total, approximately 17,700 LF of buried soil cement bank protection would be provided. This would include approximately 10,900 feet fronting the southern and eastern boundary of the tract map site on the north bank of the river and the west bank of Castaic Creek, and approximately 6,800 feet on the southern bank of the river beginning at the Long Canyon Road Bridge and continuing down stream and up stream of the project site (see **Figure 5** for the location of proposed bank stabilization).

The project also proposes to implement a portion of the previously approved Regional River Trail, and a scenic vista path. The trail and vista path are located along the southern boundary of the project site on the northern bank of the river. The project includes a 110-acre utility corridor that runs parallel to SR-126, from the western boundary of the Landmark tract map site to the approved Newhall Ranch WRP, from the eastern boundary of the tract map site to I-5, and then south to the existing Los Angeles County Sanitation District No. 32 WRP. The utility corridor would serve to extend municipal services to the project site. Erosion protection along the utility corridor would be provided by installing approximately 4,700 feet of turf reinforcement mats (TRM) along the southerly side of the utility corridor from the western end of the tract map site to the easterly end of the approved Newhall Ranch WRP. TRMs are designed to reinforce vegetation at the root and stem allowing vegetation to be used as erosion control in areas where flow conditions may exceed the ability of natural vegetation to remain rooted. The project also proposes 11 new storm drain outfalls and associated energy dissipaters. The storm drain outfalls would capture runoff and discharge it to the river after first passing through water quality treatment Best

Management Practices. (See *Landmark Village Water Quality Technical Report*, prepared by GeoSyntec Consultants, 2005.)

To reduce storm flow velocities and prevent erosion at storm water discharge points into the river, energy dissipaters consisting of either rip-rap or other larger reinforced concrete standard impact-type energy dissipaters would be constructed at the 11 storm drain outlets into the river. These energy dissipaters would slow the rate of flow of runoff into the river to prevent erosion of the stream channel. Additional dissipaters would be located at the outlet of Chiquito Creek and Long Canyon Creek.

To facilitate development of the Landmark Village site, an earth-hauling route will be established between the Long Canyon/Adobe Canyon borrow site and the Landmark Village site in order to import the necessary amount of fill material to the site. Crossing the Santa Clara River will be accomplished primarily by widening the existing agricultural river crossings that have been in place for decades. In addition, mitigation of impacts to riparian habitat will occur in the River Corridor SMA/SEA 23. Areas affected temporarily by construction activity and permanently by the installation of the project components described above will be replanted with native vegetation.

The above proposed improvements within the SMA/SEA 23 were contemplated under the approved Specific Plan. The vast majority of the adopted SMA/SEA 23 will be left in a natural state, consistent with the Specific Plan.

2. That the requested development is designed to maintain water bodies, watercourses, and their tributaries in a natural state.

Specific Plan Summary

The County's Board of Supervisors already found that the Specific Plan and SEA CUP No. 94-087-(5) met Design Compatibility Criterion No. 2, above. In summary, the Board found that the Specific Plan has been designed to maintain waterbodies, watercourses, and their tributaries in a natural state. As indicated above, the Board found that no significant increases in velocity, erosion, or sedimentation would occur in the river due to Specific Plan implementation. During most storm events, the velocity and depth of the river would remain unchanged from current conditions, since the course of the river is able to meander without being constrained by bridge abutments or bank protection. It is only in the infrequent, 50- to 100-year event where small increases in depth or velocity would occur at certain locations along the river. In making these findings, the Board relied on the Newhall Ranch Revised Additional Analysis, Volume VIII, May 2003, Section 2.3, Floodplain Modifications, which provided a

detailed analysis of the Specific Plan impacts to the floodplain areas within the site, including the depth and velocity of water flow in the Santa Clara River. Based on that analysis, the Board found that the Specific Plan's projected river flow increases did not significantly affect the water flow in the river.

Landmark Village Summary

As contemplated by the approved Specific Plan, Long Canyon Road Bridge will require the placement of piers and abutments in the river area; however, the effect of each bridge crossing, including Long Canyon Road Bridge, was thoroughly assessed in the Newhall Ranch Revised Additional Analysis, Volume VIII, May 2003, Section 2.3, Floodplain Modifications. The bridge is intended as the primary bridge crossing over the Santa Clara River providing access to the central portions of the Newhall Ranch Specific Plan. The bridge will span approximately 1,000 feet over the Santa Clara River, with a width of approximately 100 feet. Support for the bridge will involve construction of piers within the bed of the Santa Clara River. Each support will be spaced approximately 100 feet apart. Additionally, abutments and bank stabilization would be required on either side of the bridge to protect against erosive forces.

As contemplated by the approved Specific Plan, the Landmark Village development will include bank stabilization, but only where necessary to protect development from erosion, and only after satisfying FEMA and Los Angeles County Department of Public Works requirements. The Specific Plan's Conceptual Backbone Drainage Plan, as implemented by the Landmark Village Drainage and Water Quality Plan, provides drainage and flood control protection to developed uses, while preserving the Santa Clara River and major tributaries as resources. The buried bank stabilization approach uses soil cement, which is buried beneath the existing banks of the river to resist scouring. The soil placed on top of the bank stabilization is replanted with native vegetation to revegetate the disturbed area. Typically, the lining must be buried at least twice the height of the lining in order to resist scouring. Burying the toe of the lining requires temporary excavation and backfilling. A temporary construction zone of approximately 75 feet would occur at the base of the bank protection in order to bury the material. The original channel elevation would be restored after construction. The area would also be replanted with native vegetation. A total of approximately 10,920 linear feet of buried bank stabilization will be constructed on the north side of the river, and an additional 6,560 linear feet of stabilization would be constructed on the south side, for a total of 17,480 linear feet (**Figure 5, Proposed Bank Stabilization**, above). The bank stabilization along portions of the southern boundary of the river corridor, directly west of Long Canyon Bridge would be designed and constructed to retain the Santa Clara River's significant riparian vegetation and habitat, to allow the river to continue to function as a regional wildlife corridor, and to provide flood protection pursuant to County standards. All of the bank stabilization

proposed in conjunction with the project is consistent with the Newhall Ranch Specific Plan. A detailed description of the proposed bank stabilization is provided in **Section 2.5, Bank Stabilization**, above.

The Specific Plan RMP and the Newhall Ranch Program EIR (March 1999) include measures that will replace any vegetation temporarily or permanently removed (see Program EIR, Mitigation Measures 4.6-1 to 4.6-26). Following project buildout, all areas disturbed during the installation of the bridge and the bank stabilization would be vegetated with riparian-associated plant species. Additionally, areas within the proposed riparian buffer (**Figure 16, Riparian Habitat Buffers**, above) would be planted with native plant species. With mitigation, the river, Castaic Creek and Chiquito Creek would be maintained with natural soft bottoms and a predominance of buried bank protection replanted with native vegetation.

3. That the requested development is designed so that wildlife movement corridors (migratory paths) are left in an undisturbed and natural state.

Specific Plan Summary

The County's Board of Supervisors already found that the Specific Plan and SEA CUP No. 94-087-(5) met Design Compatibility Criterion No. 3, above. In summary, the Board found that under the Specific Plan, the SMA/SEA 23 would continue to function as a wildlife movement corridor because the Specific Plan design retained both the riparian vegetation in the river and the natural flow of the water without the need for periodic vegetation clearing. The Board found that the Specific Plan showed a substantially reduced level of impact to sensitive riparian habitat along the Santa Clara River (the originally proposed 103 acres of impact was reduced to approximately 1 acre). The Board further found that the Specific Plan resulted in an increase of 5 acres in the amount of sensitive riparian habitat along the river, and that the Specific Plan established transition areas to separate the SMA/SEA 23 from the urban uses identified in the Land Use Plan. In addition, the Board found that the three bridges over the river, including Long Canyon Road Bridge, would be sufficiently high as to allow the continued use of the river by animals for movement east to west along and within the river route, and that lighting controls would ensure that the SMA/SEA 23 would continue to function as a wildlife movement corridor. The Board also found that Section 2.5 (Public Services and Facilities Plan) and Section 2.6 (Resources Management Plan) of the Specific Plan provide objectives and conceptual plans for preserving the river and Salt Canyon in a natural and undisturbed state. Finally, the Board found that the Newhall Ranch Final EIR and Additional Analysis addressed impacts and imposed mitigation measures for the identified impacts that would occur. As a condition of approval, the Board required the applicant to conserve in perpetuity approximately 1,517 acres of the Salt Creek watershed in Ventura County, adjacent to the Specific Plan site, which enhances the Specific Plan's compatibility with animal movement in the region.

Moreover, the Board found that the tributaries (Castaic, San Martinez, and Chiquito Canyon Creeks) to the Santa Clara River within the SMA/SEA 23 would all be maintained and preserved in a largely natural state with soft bottoms pursuant to Section 2.5 (Public Services and Facilities Plan) and Section 2.6 (Resources Management Plan) of the Specific Plan. Furthermore, the Board found that the remainder of these tributaries outside the SMA/SEA 23 but within the Specific Plan were designated open space areas and preserved in a largely natural state.

The Board found that the Salt Canyon area of the Specific Plan served as a wildlife movement corridor, and that the limited development proposed within the adopted SMA/SEA 23 would not have an impact upon this wildlife movement area. As indicated above, the Board required the applicant to dedicate 1,517 acres of the Salt Creek watershed in Ventura County, adjacent to the Specific Plan site, in perpetuity, thereby enhancing the Specific Plan's compatibility with animal movement in the region.

In addition, the Board noted that Caltrans had completed the widening of SR-126 from Fillmore in Ventura County to the I-5 in Los Angeles County. As part of that widening project, major north/south animal movement undercrossings were installed under SR-126 at four locations. In addition, three additional larger undercrossings exist along SR-126 within the Specific Plan area at locations where bridges and culverts were constructed over secondary tributary stream courses. Because the undercrossings were designed to facilitate north/south wildlife movement, and because the three undercrossings within the Specific Plan site are of sufficient size to accommodate north/south wildlife movement, the Board found that north/south connectivity across the Santa Clara River will not be significantly impacted. The Board's findings were supported by the Newhall Ranch Revised Additional Analysis, Volume VIII, May 2003, Section 2.2, Salt Creek Corridor.

Landmark Village Summary

Consistent with the approved Specific Plan, for the most part, animal migratory paths within the SMA/SEA 23 will be left in an undisturbed, natural state. Again, the exception will be at the Long Canyon Road Bridge pier locations and abutments. The Long Canyon Road Bridge is proposed to be approximately 1,000 feet in length and a maximum of 100 feet in width. It will range from approximately 11–22 feet in height above the riverbed with an estimated 11 vertical support columns or piers extending into the riverbed. The piers will be approximately 100 feet apart from one another. When confronted with bridges or overpasses along a preferred movement corridor, wildlife, particularly larger mammals, will generally move under these structures as long as there is adequate vertical and horizontal spacing, a natural (dirt, sand, vegetation) substrate on which to travel while under the structure, and an "openness" effect that allows the animal to detect light, open space and habitat at the exiting end of the structure.

The proposed Long Canyon Road Bridge will adequately meet these requirements and is not expected to significantly alter wildlife movement along the river corridor.

Consistent with the findings of the Newhall Ranch Program EIR, development of the proposed project would limit northern access to or disbursement from the Santa Clara River for wildlife. However, given that the tract map site is currently used for agriculture and is generally devoid of cover, the tract map site is not expected to be a substantial part of a regional north-south wildlife movement corridor. In light of the above, the proposed project's impacts on regional wildlife movement would be less than significant.

Other proposed development within the SMA/SEA 23 (bank stabilization, trails, storm drain outlets, utility corridor, riparian mitigation sites and off-site transport of grading materials) will have a de minimus impact on migratory pathways. This is because cover provided by riparian vegetation to be removed by development activity would be replaced in the river corridor with native vegetation.

4. That the requested development retains sufficient natural vegetative cover and/or open spaces to buffer critical resource areas from said requested development.

Specific Plan Summary

The County's Board of Supervisors already found that the Specific Plan and SEA CUP No. 94-087-(5) met Design Compatibility Criterion No. 4, above. In summary, the Board found that the Specific Plan retained sufficient natural vegetative cover and open space areas to buffer critical resources found in the SMA/SEA 23 from the proposed development shown in the Specific Plan.

Specifically, species that utilize the Santa Clara River corridor are typically found in the riverbed itself or within the riparian habitats found adjacent to the river course. As discussed under the first compatibility criterion above, after combining the land preserved in the revised SEA (975 acres) with the preserved open area immediately adjacent to the revised SEA (415 acres), a total of 1,390 acres of undisturbed land would be preserved as part of the Specific Plan, including 577 acres of sensitive habitat. The existing SEA 23 consists of 380 acres of sensitive habitats. Due to Specific Plan implementation, the amount of sensitive riparian habitat in SEA 23 would actually increase by approximately 5 acres when compared with the amount of sensitive habitat within the existing SEA 23. This additional amount of land would provide sufficient habitat and open areas to buffer the sensitive resources from the 1 acre of sensitive habitats redesignated for non-residential land uses within existing SEA 23.

In addition to the amount of land that will be permanently preserved for use by sensitive species, the Specific Plan requires a setback between the river and proposed land uses of 75 to 100 feet in width. This area will be planted with native species to buffer sensitive species from potential impact. The Specific Plan also provides transition areas between the riparian resources of the proposed River Corridor SMA/SEA 23 and proposed urban development.

In general, the transition areas would be trails; open areas, including natural or revegetated slopes and other planted areas; and bank protection areas, which would consist of buried bank stabilization. Buried bank protection areas would be restored to a natural condition through the planting of native vegetation over the stabilized areas, thereby enabling their use by sensitive animal species.

The Specific Plan's Regional River Trail would extend along the northern edge for the entire 5-mile length of the Specific Plan. The Regional River Trail would be built on land which is elevated and provided with buried bank protection where necessary in order to eliminate flooding and bank erosion. Where bank protection does not exist, the trail would be located on a natural shelf above the elevation of the river.

The Specific Plan also includes 415 acres of open area, including oak-filled canyons, River bluffs and a Community Park that would separate riparian habitats from urban development on the south side of the river. The Specific Plan contains a number of measures that are intended to promote compatibility between developed uses and preserved open area. For example, the Specific Plan RMP (Section 2.6) contains standards covering recreation and access, location and nature of bank protection, and grading. The RMP requires graded areas adjacent to and within SEAs to be clearly marked thereby buffering and avoiding important habitat areas from impacts from development. Furthermore, Chapter 4 of the Specific Plan (Design Guidelines) requires shielded lighting fixtures to minimize glare and direct rays impacts to adjacent areas, resulting in additional protection of the habitat areas.

The tributaries (Castaic, San Martinez, and Chiquito Canyon Creeks) to the Santa Clara River are all maintained with the SMA/SEA 23, and are preserved in a largely natural state pursuant to Section 2.5 (Public Services and Facilities Plan) and Section 2.6 (Resources Management Plan) of the Specific Plan. Furthermore, the remainder of these tributaries within the Specific Plan are designated open area and are preserved in a largely natural state.

The Board of Supervisors previously evaluated the adequacy of the width of the proposed buffer area along the Santa Clara River when the Specific Plan was originally approved in March 1999. Prior to final approval, the Board required that the Specific Plan design be revised to incorporate an additional 100-foot

buffer between development and riparian resources to protect riparian habitat and sensitive species within SEA 23 boundaries. This finding was arrived at after evaluating the potential impacts of proposed land uses along the entire length of the river, coupled with the existing habitat protection and enhancement provisions contained in the Specific Plan RMP and Design Guidelines.

Exhibits depicting the Newhall Ranch River corridor riparian habitat buffers along the entire course of the Santa Clara River within the Specific Plan boundaries were presented to the Commission in a Staff Report, dated August 27, 2001. The exhibits show the width of the buffer between the riparian resources and adjacent development along the entire length of the river as originally approved by the Board. (Note that the exhibits do not reflect changes to the Potrero Bridge, the WRP site, and the other areas no longer proposed for development, which increased the acreage of riparian habitat and buffer area.)

As shown on the exhibits, the width of the riparian habitat corridor varies from a minimum of 300 feet to 2,205 feet (0.4 mile) at its widest point. The total buffer area (478 acres) varies in width from a minimum of 135 feet to more than 800 feet, and is three-quarters the size of the riparian habitat area itself. The average buffer width is approximately 400 feet. As shown on the exhibits, the buffer widths are greatest where the existing riparian habitat corridor is the narrowest; in some cases two to three times greater.

The buffer area is comprised of several different components: (a) the Salt Creek wildlife corridor connection and the High Country 1/2-mile-wide buffer at the west end of the Specific Plan on the south side of the river; (b) native upland habitats in the open area along the south side of the river; (c) disturbed areas within the river corridor that will be restored or enhanced as riparian habitat; (d) buried bank stabilization that will be revegetated with native riparian and upland plant species; and (e) landscaped open space areas such as Community Parks, the Regional River Trail and Community Trails. In addition, these Specific Plan buffer areas will be enhanced by the condition requiring the applicant to conserve approximately 1,517 acres of the Salt Creek watershed in Ventura County, adjacent to the Specific Plan site.

The Specific Plan RMP (Chapter 2.6) provides standards by which biological resources will be managed during construction and thereafter for the life of the community. It contains (a) provisions for restoration and enhancement of disturbed areas such as agricultural fields; (b) restrictions on pedestrian and vehicular access to the river corridor; (c) design standards for transition areas between development and the river; (d) conveyance of conservation easements; and (e) preparation of a financial plan for the long-term management of the riparian resources by the Center for Natural Lands Management. In addition, the Specific Plan RMP Design Guidelines contain provisions restricting the manner in which developed areas relate to the river corridor, including site planning, fencing, landscape design, grading and lighting.

These measures satisfy the General Plan SEA design compatibility criteria as means to protect sensitive habitat and species, including the unarmored threespine stickleback and least Bell's vireo.

In summary, the Specific Plan retains sufficient natural vegetative cover and open space to buffer critical resources found in the SMA/SEA 23 from the proposed development shown in the Specific Plan. Specific Plan implementation would result in the direct preservation of 1,390 acres of land along the Santa Clara River corridor within the boundaries of the Specific Plan area. The Specific Plan also incorporates an extensive buffer area to protect critical resources within the SMA/SEA 23.

Landmark Village Summary

Consistent with the approved Specific Plan, the proposed development within Landmark Village will retain sufficient natural vegetative cover and/or open space areas to complement the adopted SMA/SEA 23. As part of the Landmark Village development, a setback or buffer zone will be established along the southern boundary of the tract map site to protect sensitive habitat along the SMA/SEA 23. The proposed project maintains a buffer ranging in width from 700 feet to 70 feet. While the buffer is generally greater than 100 feet, the buffer is reduced to 70 feet for approximately 100 feet along the western boundary of the tract map (just to the south of SR-126). This area is located adjacent to Chiquito Canyon Creek in an area that has been disturbed by the construction and operation of SR-126, as well as by agricultural-related activities. The vegetation within the reduced buffer area is characterized disturbed sandy soils and areas of sparse, disturbed riparian vegetation. This area is located to the north of the well-developed cottonwood willow riparian forest associated with the confluence of Chiquito Canyon Creek and the Santa Clara River. Given the proximity of the reduced buffer area to SR-126, and the disturbed condition and limited extent of riparian habitat present, use of the area by special-status bird species is expected to be limited. A minimum of a 100-foot buffer is present along all other portions of the tract map site and in all areas bordering mature cottonwood willow riparian forest and willow scrub habitats. Furthermore, the vegetation within portions of the setback or buffer area will be restored and/or enhanced to increase habitat values when compared to existing conditions.

5. That where necessary, fences or walls are provided to buffer important habitat areas from development.

Specific Plan Summary

The County's Board of Supervisors already found that the Specific Plan and SEA CUP No. 94-087-(5) met Design Compatibility Criterion No. 5, above. In summary, the Board found that the discussion of Design

Compatibility Criterion No. 4, above, described how the Specific Plan incorporated vegetative cover and open space areas to buffer critical resources from the proposed uses in the Specific Plan. In addition to these features, the Board found that the Specific Plan buffered habitat from proposed uses through development regulations and design guidelines. As indicated in Chapter 4 of the Specific Plan, future residential subdivisions and commercial development constructed within the Specific Plan area must include fences or walls that will preclude access to sensitive resources within SEA 23. As each tract or parcel map is submitted to the County, it must be reviewed to determine whether proposed uses substantially comply with the standards, regulations, and guidelines of the Specific Plan, including those pertaining to fencing and walls to ensure that they buffer important SMA/SEA 23 habitat areas from development.

Landmark Village Summary

Consistent with the approved Specific Plan, the Landmark Village development proposes fences and walls to protect significant habitat within the adopted SMA/SEA 23. A hiking/biking trail is proposed along the bank of the Santa Clara River beginning at the northeastern project boundary along Castaic Creek and extending west along the Santa Clara River. The conceptual alignment follows the top of the bank stabilization (approximately 50–150 feet from the existing riparian edge). The trail is approximately 16 feet wide and approximately 2 miles in length. It will be constructed of asphalt or similar material. Themed fencing will define the perimeter of the trail and the alignment will be landscaped with native plant materials and the trail will not be lighted at night. In addition, other mitigation measures and conditions of approval will be adopted to ensure the protection of sensitive biotic resources within the SMA/SEA 23 (e.g., shielding of illumination).

6. That roads and utilities serving the proposed development are located and designed so as not to conflict with critical resources, habitat areas or migratory paths.

Specific Plan Summary

The County's Board of Supervisors already found that the Specific Plan and SEA CUP No. 94-087-(5) met Design Compatibility Criterion No. 6, above. In summary, the Board found that the Specific Plan proposed the construction of three bridges and several utility lines across the Santa Clara River, within the existing SEA 23. Utilities serving the proposed Specific Plan, where feasible, would be incorporated with the river bridges.

The Board found that the bridge crossings, including the Long Canyon Road Bridge, would have support columns in the riverbed, but the crossings are elevated structures so as to reduce impacts on river vegetation and sensitive species and to allow species that move along the river course to continue to use existing resources. Moreover, the Board found that the elevated bridge crossings would ultimately replace the existing at-grade agriculture crossings, which would minimize the amount of direct disturbance to the riverbed and its environs. Based on the assessment provided in the Newhall Ranch Revised Additional Analysis, Volume VIII, May 2003, Section 2.4, SEA General Plan Consistency, the Board concluded that the roads and utilities serving the Specific Plan were located and designed so as not to conflict with critical resources, habitat areas or migratory paths.

Landmark Village Summary

Consistent with the approved Specific Plan, at the project level, the Landmark Village development will design and locate project roads and utilities so as not to conflict with critical resources, habitat areas or migratory paths. The vast majority of roadways and utilities serving Landmark Village are removed far to the north of the SMA/SEA 23 and have no impacts to it. The number and location of the bridge crossings were established by the Specific Plan in part to minimize impacts on the SMA/SEA 23 and other sensitive resources. As part of the Landmark Village development, the Long Canyon Road Bridge crossing will be implemented. All other roads within the Landmark Village development are designed to parallel SEA and loop back to the planned Long Canyon Road Bridge crossing, or to SR-126. All roads used by daily vehicular traffic are outside of the adopted SMA/SEA 23. Only minor encroachment from trails and public improvements encroach within the SMA/SEA 23. Encroachments necessary as part of the utility corridor would be located adjacent to SR-126 and would be buried. Any natural area impacted by construction activity would be replanted with native vegetation.

13.0 MITIGATION MEASURES

The Landmark Village project would be subject to the mitigation measures/conditions of approval contained in the RMP of the Newhall Ranch Specific Plan and the Newhall Ranch Program EIR. These mitigation measures have been reviewed and approved by the County in association with the Newhall Ranch Specific Plan and WRP (May 27, 2003). These measures are all contained in the Newhall Ranch Specific Plan Mitigation Monitoring Plan, which is provided in **Appendix C**.

Measures from the Natural River Management Plan (NRMP) Final EIR/EIS, 404 Permit and 1603 Streambed Alteration Agreement for Portions of the Santa Clara River and its Tributaries (1998) prepared by ACOE and CDFG are also included below. The NRMP analyzes impacts associated with the implementation of various public improvements (bank stabilization, trails, bridges, utility crossings, etc.) along and within portions of the Santa Clara River adjacent to upstream Newhall Land properties. Although the NRMP did not cover the portion of the river bordering the Landmark Village tract map site, the NRMP provides relevant guidance and methods approved by CDFG, ACOE and the County to address impacts on sensitive biological resources associated with the Santa Clara River and its environs. The Landmark Village applicant is seeking approval of a Master 404 Permit from the ACOE and a Master 1600 Agreement from the CDFG for the Newhall Ranch Specific Plan area, including the Landmark Village site. The environmental document is in process at this time and a draft of the EIR/EIS is expected to be released for public review late 2005.

To mitigate impacts to biological resources not fully addressed by the RMP, the Newhall Ranch Program EIR, the Additional Analysis and the incorporated NRMP measures, additional mitigation measures are proposed as part of this Biota Report to further reduce the magnitude of potentially significant impacts.

The numbering system of the mitigation measures provided below corresponds with, and follows sequentially, the numbering system used in the adopted Newhall Ranch Specific Plan revised Mitigation Monitoring Plan, which is provided in **Appendix C**. The Newhall Ranch Mitigation Monitoring Plan includes Mitigation Measures 4.6-1 through 4.6-80.

13.1 NRMP MITIGATION MEASURES

To further reduce impacts to biological resources that would result from project implementation, the following mitigation measures from the NRMP are hereby incorporated into this report. (NOTE: These

measures have been modified to address all of the special-status wildlife species [potentially] occurring on the Landmark Village project site and other site-specific conditions.)

4.6-81 Construction activities in the riverbed shall be restricted to the following areas of temporary disturbance: (1) an 85-foot-wide zone that extends into the river from the base of the rip-rap gunite or soil cement bank protection from where it intercepts the river bottom; (2) 100 feet on either side of the outer edge of a new bridge or bridge to be modified; (3) 50-foot-wide corridor for all utility lines; and (4) 20-foot-wide temporary access ramps and roads to reach construction sites. The locations of these temporary construction sites and the routes of all access roads shall be shown on maps submitted with the Verification Request Letter submitted to the ACOE and CDFG for individual project approval. The construction plans should indicate what type of vegetation, if any, would be temporarily disturbed and the post-construction activities to facilitate natural revegetation of the temporarily disturbed areas.

4.6-82 Prior to initiating construction for the installation of bridges, storm drain outlets, utility lines, and/or bank protection, all construction sites and access roads within the riverbed, as well as all riverbed areas within 300 feet of the construction site and access road, shall be inspected by a qualified biologist for the presence of arroyo toad, southwestern pond turtle, two-striped garter snake, unarmored threespine stickleback, Santa Ana sucker and arroyo chub. The ACOE, USFWS and the CDFG shall be notified of the inspection and shall have the option of attending. If any of the above agencies is not represented, the biologist shall file a written report of the inspection with the agency not in attendance within 14 days of the survey and no sooner than 30 days prior to any construction work in the riverbed.

4.6-83 Construction work areas and access roads shall be cleared of arroyo toad, southwestern pond turtle, two-striped garter snake, unarmored threespine stickleback, Santa Ana sucker and arroyo chub immediately before the prescribed work is to be carried out, immediately before any equipment is moved into or through the stream or habitat areas, and immediately before diverting any stream water. The removal of such species shall be conducted by a qualified biologist using procedures approved by the ACOE, USFWS and CDFG, and with the appropriate collection and handling permits. Species shall be relocated to nearby suitable habitat areas. A plan to relocate these species shall be submitted to the ACOE, USFWS and CDFG for review and approval no later than 30 days prior to construction. Under no circumstances shall the unarmored threespine stickleback or arroyo toad be collected or relocated, unless USFWS personnel or their agents implement this measure.

4.6-84 A qualified biologist shall be present when any stream/river diversion takes place, or when blocking nets and seines are used (see also EIR Mitigation Measure 4.6-57), and shall patrol the areas both within, upstream and downstream of the work area to rescue any species stranded by the diversion of the stream water or trapped by the nets/seines. Species that are collected shall be relocated to suitable locations downstream of the work area. Under no circumstances shall the unarmored threespine stickleback or arroyo toad be collected or relocated, unless USFWS personnel or their agents implement this measure.

4.6-85 Blocking nets, or fences with 1/4-inch-square mesh, 18 inches high and buried 6 inches, shall be placed downstream of the work area to assure that none of the species move into the construction area.

4.6-86 Installation of bridges, culverts or other structures shall not impair movement of fish and aquatic life. Bottoms of temporary culverts shall be placed at or below channel grade. Bottoms of permanent culverts shall be placed below channel grade.

13.2 ADDITIONAL MITIGATION MEASURES

To further reduce the magnitude of impacts to biological resources that would result from project implementation, the following mitigation measures would be required and are hereby incorporated into this report:

4.6-87 The riparian revegetation plan to be developed by the applicant shall demonstrate the feasibility of creating the required mitigation acreage (see Mitigation Measure 4.6-63). The plan shall specify, at a minimum, the following: (1) the location of mitigation sites; (2) the quantity and species of plants to be planted; (3) procedures for creating additional habitat; (4) methods for the removal of non-native plants; (5) a schedule and action plan to maintain and monitor the enhancement/restoration area; (6) a list of criteria and performance standards by which to measure success of the mitigation sites; (7) measures to exclude unauthorized entry into the riparian creation/enhancement areas; and (8) contingency measures in the event that mitigation efforts are not successful. The plan shall be subject to the approval of CDFG, ACOE, and the County, and approved prior to issuance of the grading permit.

4.6-88 Within 30 days of ground disturbance activities associated with construction or grading that would occur during the nesting/breeding season of native bird species potentially nesting on the site (typically March through August in the project region, or as determined by a qualified

biologist), the applicant shall have weekly surveys conducted by a qualified biologist to determine if active nests of bird species protected by the Migratory Bird Treaty Act and/or the California Fish and Game Code are present in the disturbance zone or within 300 feet (500 feet for raptors) of the disturbance zone. The surveys shall continue on a weekly basis with the last survey being conducted no more than seven days prior to initiation of disturbance work. If ground disturbance activities are delayed, then additional pre-disturbance surveys shall be conducted such that no more than seven days will have elapsed between the survey and ground disturbance activities.

If active nests are found, clearing and construction within 300 feet of the nest (500 feet for raptors) shall be postponed or halted, at the discretion of the biologist, until the nest is vacated and juveniles have fledged, as determined by the biologist, and there is no evidence of a second attempt at nesting. Limits of construction to avoid an active nest shall be established in the field with flagging, fencing or other appropriate barriers, and construction personnel shall be instructed on the sensitivity of nest areas. The biologist shall serve as a construction monitor during those periods when construction activities will occur near active nest areas to ensure that no inadvertent impacts on these nests occur. The results of the surveys, and any avoidance measures taken, shall be submitted to the County of Los Angeles within 30 days of completion of the pre-construction surveys and/or construction monitoring to document compliance with applicable state and federal laws pertaining to the protection of native birds.

4.6-89 A pre-ground disturbance survey shall be conducted by a qualified biologist (subject to approval by the County) within 14 days or any disturbance activities in all areas on the project site containing suitable habitat for coast horned lizard, silvery legless lizard, coastal western whiptail, rosy boa, San Bernardino ringneck snake, coast patch-nosed snake, southwestern pond turtle, two-striped garter snake, American badger, San Diego black-tailed jackrabbit and San Diego desert woodrat. If any of these species are observed within the disturbance zone, they shall be relocated to a suitable area outside of the disturbance zone[SM1]. Results of the surveys and relocation efforts shall be provided to CDFG. Collection and relocation of animals shall only occur with the proper scientific collection and handling permits.

If active San Diego desert woodrat nests (stick houses) with young are identified within the disturbance zone or within 100 feet of the disturbance zone, a fence shall be erected around the nest site with a 100-foot minimum buffer from construction activities. This buffer may be greater, if determined to be appropriate by the biologist. At the discretion of the biologist, clearing and construction within the fenced area would be postponed or halted until young have left the nest.

The biologist shall serve as a construction monitor during those periods when disturbance activities will occur near active nest areas to ensure that no inadvertent impacts on these nests will occur. If San Diego desert woodrats are observed within the grading footprint outside of the breeding period, individuals shall be relocated to a suitable location on or in proximity to the project site by a qualified biologist in possession of a scientific collecting permit.

4.6-90 No earlier than 20 days prior to any grading activity that would occur during the breeding season of native bat species potentially utilizing the site (April 1 through August 31), a field survey shall be conducted by a qualified biologist (retained by the applicant, with selection reviewed by the County) to determine if active roosts of special-status bats such as western mastiff bat, fringed myotis and yuma myotis are present in areas of the project site containing suitable roosting habitat, such as woodlands and buildings. If active roosts are found, construction within 200 feet shall be postponed or halted, at the discretion of the biological monitor, until the roost is vacated and juveniles have fledged, as determined by the biologist. Implementation of this measure would ensure that no loss of active roost colonies of either species will occur and, therefore, will reduce impacts on bat species to a less than significant level.

4.6-91 Prior to the issuance of a grading permit, the applicant shall prepare a landscaping plan. This plan will be subject to review and approval by the County and CDFG and will include a plant palette composed of non-invasive species that are adapted to the conditions found on the Landmark Village site, without requiring high irrigation rates. The landscaping plan will also include a list of invasive plant species prohibited from being planted on the project site. This list of prohibited plants will be compiled in cooperation with a qualified restoration specialist and will be distributed to future occupants of the Landmark Village site.

4.6-92 Waste and recycling receptacles that discourage foraging by wildlife species adapted to urban environments shall be installed in common areas and parks throughout the Landmark Village site.

4.6-93 The Landmark Village Home Owners Association shall supply educational information to future residents of the Landmark Village site regarding the importance of not feeding wildlife, ensuring that trash (containing food) is not accessible to wildlife, keeping the ground free of fallen fruit from trees and not leaving pet food outside.

4.6-94 All oaks with driplines within 50 feet of land clearing (including brush clearing) or areas to be graded shall be enclosed in a temporary fenced zone for the duration of the clearing or grading activities. Fencing shall extend to the root protection zone (i.e., the area at least 15 feet from the trunk or half again as large as the distance from the trunk to the drip line, whichever distance is

greater). No parking or storage of equipment, solvents or chemicals that could adversely affect the trees shall be allowed within 25 feet of the trunk at any time. Removal of the fence shall occur only after the project biologist confirms the health of preserved trees.

4.6-95 Prior to use and placement on the Landmark Village site, all landscaping materials (including organic mulches) shall be inspected and certified "free" of Argentine ants.

4.6-96 A mitigation plan for elderberry scrub shall be developed and implemented by the applicant. The plan shall demonstrate the feasibility of replacing the acreage of this plant community to be removed at a 1:1 ratio. The plan shall specify, at a minimum, the following: (1) the location of mitigation sites; (2) the quantity and species of plants to be planted; (3) procedures for creating additional habitat; (4) methods for the removal of non-native plants; (5) a schedule and action plan to maintain and monitor the mitigation area; (6) a list of criteria and performance standards by which to measure success of the mitigation sites; (7) measures to exclude unauthorized entry into the mitigation areas; and (8) contingency measures in the event that mitigation efforts are not successful. The plan shall be subject to the approval of the County prior to the issuance of grading permits.

4.6-97 Prior to the issuance of a grading permit for ground disturbance, construction or site preparation activities, the applicant shall retain the services of a qualified biologist, approved by the CDFG and Los Angeles County, to conduct appropriately timed focused surveys for spadefoot toad within all portions of the project site containing suitable breeding habitat. If western spadefoot are not identified on the project site, no further measures would be required. Should western spadefoot be identified on the project site, the measures provided below would be implemented.

(A) Under the direct supervision of the qualified biologist, western spadefoot toad habitat shall be created within suitable natural sites on the Newhall Ranch Specific Plan area, outside of the proposed development envelope. The amount of occupied breeding habitat to be impacted by the Landmark Village project shall be replaced at a 2:1 ratio. The actual relocation site design and location shall be approved by CDFG and consist of a shallow excavated pond(s) utilizing an artificial rubber pond liner as a base. The location shall be as far away as possible from any of the homes and roads to be built. The relocation pond(s) shall be designed such that it only supports standing water for several weeks following seasonal rains in order that aquatic predators (i.e., fish, bullfrogs, crayfish, etc.) cannot become established. The size and number of ponds shall be determined by CDFG. Terrestrial habitat surrounding the proposed relocation site shall be as similar in type, aspect, and density to the location of the existing ponds as possible. No site preparation or construction activities shall be permitted in the vicinity of the currently occupied ponds until the design and construction of the pool habitat in preserved areas of the site has been completed and the relocation of all western spadefoot toad adult, tadpoles, and egg masses detected are moved to the created pool habitat to the satisfaction of the monitoring biologist and CDFG.

(B) Based on appropriate rainfall and temperatures, generally between the months of February and April, the biologist shall conduct a series of surveys in all appropriate habitats within the development envelope prior to the initiation of construction activities. Surveys will include evaluation of all previously documented occupied areas and a reconnaissance level survey of the remaining natural areas of the site. All western spadefoot adults, tadpoles, and egg masses encountered shall be collected and released in identified relocation pond(s) described above.

(C) The qualified biologist shall monitor the relocation site for a minimum period of five years, or as otherwise directed by CDFG. Specific monitoring requirements and success criteria shall be approved by CDFG. It is expected that minimum requirements will include annual monitoring during and immediately following peak breeding season such that surveys can be conducted for adults as well as for egg masses, larval and post larval toads. Further, survey data will be provided to CDFG by the monitoring biologist following each monitoring period and a written report summarizing the monitoring results will be provided to CDFG at the end of the monitoring effort. Success criteria for the monitoring program shall include verifiable evidence of toad reproduction at the relocation site.

4.6-98 For all grading and construction activities a qualified biologist shall be retained by the applicant (with selection reviewed by the County) to ensure that incidental construction impacts on special-status wildlife species are avoided or minimized. The biologist shall be in possession of a Scientific Collecting permit and relocate any wildlife species (for which they are permitted to handle) that may be destroyed or adversely affected as a result of construction and/or site preparation activities. Should a state or federally listed species be encountered, construction shall be halted until a permitted biologist can relocate the animal(s). Responsibilities of the construction biological monitor include the following:

- Attend the pre-construction meeting to ensure that timing/location of construction activities do not conflict with other mitigation requirements (e.g., seasonal surveys for nesting birds). Conduct meetings with the contractor and other key construction personnel describing the importance of restricting work to designated areas.
- Discuss procedures for minimizing harm/harassment of wildlife encountered during construction.
- Review/designate the construction area in the field with the contractor in accordance with the final grading plan. Haul roads, access roads, and on-site staging and storage areas shall be sited within grading areas to minimize degradation of habitat adjacent to these areas. If activities outside these limits are necessary, they shall be evaluated by the biologist to ensure no special-status species or habitat will be affected.
- Conduct a field review of the staking (to be set by the surveyor) designating the limits of all construction activity. Any construction activity areas immediately adjacent to riparian areas or other special-status resources (such as large trees or bird nests) may be flagged or temporarily fenced by the monitor, at his/her discretion.
- Periodically visit the site during construction to coordinate and monitor compliance with the above provisions.
- Submit to the County an immediate report of any conflicts or errors resulting in impacts to special-status resources as well as a final report on the results of construction and any recommendations for improving the process.

4.6-99 A mitigation plan for slender mariposa lily shall be developed prior to the issuance of a grading permit and implemented by the applicant. The plan shall include an assessment of enhancement opportunities of slender mariposa lily populations occurring within protected areas in the High Country SMA, the River Corridor SMA, the Salt Creek Corridor, and spineflower preserves. The plan shall demonstrate the feasibility of replacing the number of individual plants to be removed at a 1:1 ratio and/or enhancing and protecting existing populations of the species. The mitigation ratio should take in consideration the existing population of slender mariposa lily that are being preserved in Salt Creek, which is located within the Specific Plan area, to the south of the Landmark Village project site. A total of 30,830 slender mariposa lily plants have been recorded in Salt Creek (Dudek & Associates 2003). The plan shall specify, at a minimum, the following: (1) the location of mitigation sites in protected/preserved areas within the Newhall Ranch Specific Plan area; (2) methods for harvesting seeds and salvaging and transplantation of individual bulbs/plants to be impacted; (3) site preparation procedures for the mitigation site; (4) a schedule and action plan to maintain and monitor the mitigation area; (5) a list of criteria and performance standards by which to measure success of the mitigation site; (6) measures to exclude unauthorized entry into the mitigation areas; and (7) contingency measures in the event that mitigation efforts are not successful. The plan shall be subject to the approval of the County prior to the issuance of a grading permit.

4.6-100 Appropriately timed focused surveys for the undescribed species of *Gnaphalium* (**Bio-6**) shall be conducted by a qualified botanist prior to the commencement of grading/construction activities within suitable habitat (primarily river terraces) of the species to determine if plants have established within potential impacted areas since the time of the 2005 survey. No longer than one year shall elapse between completion of the survey and commencement of construction activities. Should the species be documented within the project boundary, avoidance measures shall be implemented to minimize impacts to individual plants. These measures shall include adjusting the boundaries/location of haul routes and other project features. If, due to project design constraints, avoidance of all plants is not possible, then available methods for salvaging seeds and/or transplantation of individual plants to be impacted will be evaluated and implemented. All seed collection and/or transplantation methods, as well as the location of the receiver site for seeds/plants (assumed to be within preserved open space areas of Newhall Ranch along the Santa Clara River), shall be coordinated and approved by the County prior to the issuance of a grading permit.

4.6-101 The Oak Resource Replacement Plan to be prepared (as described in Mitigation Measure 4.6-48) shall include measures to create, enhance, and/or restore 7.82 acres of coast live oak woodland within the High Country SMA. The plan shall be subject to the requirements outlined in Mitigation Measure 4.6-48.

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APPENDIX A

Guidelines Compliance Checklist

Appendix A—GUIDELINE COMPLIANCE CHECKLIST

	PAGE	PREPARER'S INITIALS
Setting	33	KB
Original topographical quad sheet (or color photocopy)	35	KB
Project site photographs or color photocopies	Appendix F-2	KB
Color aerial photographs	12,13,16,19,30,44,59,78,111, Appendix F-2	KB
SEA/SERA map	36	KB
Biotic survey of the project site	Appendix E-1	KB
Floral and faunal lists in systematic/alphabetic order	Appendix D-23	KB
Table of sensitive species impacts matrix	Appendix D-3	KB
Document showing CNDDB contact	Appendix G-2	KB
Site/grading plans	16	KB
Initial study questionnaire	Appendix B-2	KB
Impacts	80	KB
Mitigation measures	142	KB
Mitigation monitoring	Appendix C-3	KB
Preparer's resume/qualifications	Appendix H-2	KB

APPENDIX B

Initial Study Checklist

STAFF USE ONLY

PROJECT NUMBER: *00-196*

CASES: *TR 53108*

SPA, CUP

*** * * * INITIAL STUDY * * * ***

COUNTY OF LOS ANGELES
DEPARTMENT OF REGIONAL PLANNING

GENERAL INFORMATION

I.A. Map Date: *June 10, 2003* Staff Member: *Hsiao-ching Chen*

Thomas Guide: *4459 E5, E6* USGS Quad: *Val Verde*

Location: *South of State Route 126 ("SR-126") near the intersection with Chiquito Canyon Road north of Santa Clarita River and west of the Castaic Creek.*

Description of Project: *An application to subdivide the subject property into 418 lots to include a maximum of 1,444 residential units , a maximum of 1,353,000 square feet of non-residential mixed-used space, an elementary school, a community park, three private recreational facilities, open space and river trail uses. This Initial Study analyzes impacts associated with all off-site improvements including buried bank stabilization and the Long Canyon Road Bridge to be developed in conjunction with the tract development. Two borrow sites (one located south of the Santa Clara River and the other north of SR-126 of unspecified acreage) and possible haul routes will be located outside of the tract map boundary but within the SP area. The domestic water system will be connected to existing facilities within the Valencia Commerce Center to the northeast)* Gross Area: *291.2 acres(tract map)*

Environmental Setting: *The project site is the first phase of the Riverwood Village Planning Area development of the Newhall Ranch Specific Plan in western unincorporated Los Angeles County, north of the Santa Clara River and west of Interstate 5 ("I-5"). The site is currently used for agricultural purposes and contains miscellaneous, ancillary sheds for agricultural storage and dirt roads. There is southern willow riparian habitat that extends to the central portion of the site along the southern boundary of the tract map. Three oak trees exist on site. Chiquita Landfill is located to the north of the project site. Several active and abandoned oil wells are located within the tract boundary. Some off-site improvement analyzed in this Initial Study are within SEA 23, Santa Clara River, containing habitat for endangered stickleback.*

Zoning: *Commercial, Mixed-Used, Medium Residential, Low-Medium Residential, Low Residential, High Residential, River Corridor, Community Park, Business Park, Open Area, (Newhall Ranch Specific Plan)*

General Plan: *(Newhall Ranch Specific Plan)*

Community/Area Wide Plan: *(Newhall Ranch Specific Plan)*

Major projects in area:

Project Number	Description & Status
00-210	*Castaic Junction Industrial Park (pending)*
89-081	*Chiquita Canyon Landfill (approved)*
87-360	*Valencia Commerce Center (approved)*
03-238 / TR 60030	*21 industrial lots on 110 AC (pending)*

NOTE: For EIRs, above projects are not sufficient for cumulative analysis.

REVIEWING AGENCIES

Responsible Agencies

- ☐ None
- ☒ Regional Water Quality Control Board
  - ☒ Los Angeles Region
  - ☐ Lahontan Region
- ☐ Coastal Commission
- ☒ Army Corps of Engineers
- ☒ *Caltrans*

Trustee Agencies

- ☐ None
- ☒ State Fish and Game
- ☒ State Parks
- ☒ *USFWS*
- ☐ _____

Special Reviewing Agencies

- ☐ None
- ☒ Santa Monica Mountains Conservancy
- ☒ Castaic Union SD
- ☒ William S. Hart SD
- ☒ Castaic Area Town Council
- ☒ California Dept of Water Resources
- ☒ *SCOPE (courtesy notification)*
- ☒ *Valencia Water Company*
- ☒ *DOC DOGGR*
- ☒ *DTSC, AQMD*
- ☒ *City of Santa Clarita*
- ☒ *Ventura County*
- ☒ *SCAG*

Regional Significance

- ☐ None
- ☒ SCAG Criteria
- ☒ Air Quality
- ☒ Water Resources

County Reviewing Agencies

- ☒ Subdivision Committee
- ☒ DPW: *Traffic & Lighting, Transportation Planning, Waterworks, Env Programs, Design, Land Development (Drainage & Grading), Geotechnical and Materials Engineering, Watershed, Waterworks, Flood Maintenance, Programs Development, Building & Safety,*
- ☒ Health Services: *Env Hygiene*
- ☒ *San District, Sheriff*
- ☒ *FD, Library*

IMPACT ANALYSIS MATRIX

CATEGORY	FACTOR	Pg	Less than Significant Impact/No Impact	Less than Significant Impact with Project Mitigation	Potentially Significant Impact	Potential Concern
			ANALYSIS SUMMARY (See individual pages for details)			
HAZARDS	1. Geotechnical	5	☐	☐	☒	*Expansive soil, high groundwater, excessive grading*
	2. Flood	6	☐	☐	☒	*100-year floodplain*
	3. Fire	7	☒	☐	☐	
	4. Noise	8	☐	☐	☒	*School/residences adjacent to SR-126*
RESOURCES	1. Water Quality	9	☐	☐	☒	*Construction, domestic water supply from groundwater*
	2. Air Quality	10	☐	☐	☒	*Exceed AQMD regional threshold, non-attainment area*
	3. Biota	11	☐	☐	☒	*SEA 23, oaks, southern willow riparian habitat*
	4. Cultural Resources	12	☐	☐	☒	*known resources in the area*
	5. Mineral Resources	13	☐	☐	☒	*Site was previouly used for oil extraction*
	6. Agriculture Resources	14	☐	☐	☒	*Prime farmland*
	7. Visual Qualities	15	☐	☐	☒	*SR-126 scenic corridor*
SERVICES	1. Traffic/Access	16	☐	☐	☒	*Exceed CMP threshold*
	2. Sewage Disposal	17	☐	☐	☒	*Sewage disposal prior to construction of treatment plant*
	3. Education	18	☐	☐	☒	*Limited school space*
	4. Fire/Sheriff	19	☐	☐	☒	*Project specific impacts and mitigations to be determined*
	5. Utilities	20	☐	☐	☒	*Water, solid waste*
OTHER	1. General	21	☐	☐	☒	*Community characteristics*
	2. Environmental Safety	22	☐	☐	☒	*Abandoned oil wells*
	3. Land Use	23	☐	☐	☒	*Specific plan amendment*
	4. Pop./Hous./Emp./Rec.	24	☐	☐	☒	*Demand for new recreation facility*
	Mandatory Findings	25	☐	☐	☒	*Biota, air quality*

DEVELOPMENT MONITORING SYSTEM (DMS) *

As required by the Los Angeles County General Plan, DMS shall be employed in the Initial Study phase of the environmental review procedure as prescribed by state law.

1. Development Policy Map Designation: *Urban expansion and SEA*
2. ☒ Yes ☐ No Is the project located in the Antelope Valley, East San Gabriel Valley, Malibu/Santa Monica Mountains or Santa Clarita Valley planning area?
3. ☒ Yes ☐ No Is the project at urban density and located within, or proposes a plan amendment to, an urban expansion designation?

If both of the above questions are answered "yes", the project is subject to a County DMS analysis.

☒ Check if DMS printout generated (attached) Date of printout: *7/22/2003*

☐ Check if DMS overview worksheet completed (attached)

*EIRs and/or staff reports shall utilize the most current DMS information available.

Environmental Finding:

FINAL DETERMINATION: On the basis of this Initial Study, the Department of Regional Planning finds that this project qualifies for the following environmental document:

☐ NEGATIVE DECLARATION, inasmuch as the proposed project will not have a significant effect on the environment.

An Initial Study was prepared on this project in compliance with the State CEQA Guidelines and the environmental reporting procedures of the County of Los Angeles. It was determined that this project will not exceed the established threshold criteria for any environmental/service factor and, as a result, will not have a significant effect on the physical environment.

☐ MITIGATED NEGATIVE DECLARATION, inasmuch as the changes required for the project will reduce impacts to insignificant levels (see attached discussion and/or conditions).

An Initial Study was prepared on this project in compliance with the State CEQA Guidelines and the environmental reporting procedures of the County of Los Angeles. It was originally determined that the proposed project may exceed established threshold criteria. The applicant has agreed to modification of the project so that it can now be determined that the project will not have a significant effect on the physical environment. The modification to mitigate this impact(s) is identified on the Project Changes/Conditions Form included as part of this Initial Study.

☒ ENVIRONMENTAL IMPACT REPORT*, inasmuch as there is substantial evidence that the project may have a significant impact due to factors listed above as "significant."

☐ At least one factor has been adequately analyzed in an earlier document pursuant to legal standards, and has been addressed by mitigation measures based on the earlier analysis as described on the attached sheets (see attached Form DRP/IA 101). The EIR is required to analyze only the factors not previously addressed.

Reviewed by: *Hsiao-ching Chen* Date: _____

Approved by: *Daryl Koutnik* Daryl Koutnik Date: 26 AUGUST 2003

☐ This proposed project is exempt from Fish and Game CEQA filling fees. There is no substantial evidence that the proposed project will have potential for an adverse effect on wildlife or the habitat upon which the wildlife depends. (Fish & Game Code 753.5).

☐ Determination appealed--see attached sheet.

*NOTE: Findings for Environmental Impact Reports will be prepared as a separate document following the public hearing on the project.

HAZARDS - 1. Geotechnical

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Is the project site located in an active or potentially active fault zone, Seismic Hazards Zone, or Alquist-Priolo Earthquake Fault Zone?
				Salt Creek and Del Valle Fault Zone are located to the west of the tract map
b.	☒	☐	☐	Is the project site located in an area containing a major landslide(s)?
				Project site contains a landslide area
c.	☐	☒	☐	Is the project site located in an area having high slope instability?
d.	☒	☐	☐	Is the project site subject to high subsidence, high groundwater level, liquefaction, or hydrocompaction?
				Groundwater levels vary between 6 to 27 feet.
e.	☒	☐	☐	Is the proposed project considered a sensitive use (school, hospital, public assembly site) located in close proximity to a significant geotechnical hazard?
				Project contains an elementary school and residential development
f.	☒	☐	☐	Will the project entail substantial grading and/or alteration of topography including slopes of more than 25%?
				Total grading is estimated to be approximately 7 million cubic yards.
g.	☒	☐	☐	Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?
				Expansive soils present on site.
h.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

☒ Building Ordinance No. 2225 C Sections 308B, 309, 310 and 311 and Chapters 29 and 70.

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design ☒ Approval of Geotechnical Report by DPW

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be impacted by, **geotechnical** factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

HAZARDS - 2. Flood

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Is a major drainage course, as identified on USGS quad sheets by a dashed line, located on the project site? *Santa Clara River, Castaic Creek, and Chiquito Canyon are adjacent to the property*
b.	☒	☐	☐	Is the project site located within or does it contain a floodway, floodplain, or designated flood hazard zone? *Portions of the tract are within 100-year FEMA floodplain*
c.	☐	☐	☒	Is the project site located in or subject to high mudflow conditions? *Santa Clara River, Castaic Creek, and Chiquito Canyon are adjacent to the property*
d.	☐	☐	☒	Could the project contribute or be subject to high erosion and debris deposition from run off? *Earthwork during site development would have the potential to increase erosion and deposition during periods of heavy rain.*
e.	☒	☐	☐	Would the project substantially alter the existing drainage pattern of the site or area? *Project includes a man-made drainage network to capture and control runoff.*
f.	☒	☐	☐	Other factors (e.g., dam failure)? *Site is within the Castaic Lake dam inundation area*

STANDARD CODE REQUIREMENTS

☐ Building Ordinance No. 2225 C Section 308A ☐ Ordinance No. 12,114 (Floodways)
☒ Approval of Drainage Concept by DPW

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be impacted by **flood (hydrological)** factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

HAZARDS - 3. Fire

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Is the project site located in a Very High Fire Hazard Severity Zone (Fire Zone 4)? *Site is located within Fire Zone 3*
b.	☐	☒	☐	Is the project site in a high fire hazard area and served by inadequate access due to lengths, widths, surface materials, turnarounds or grade?
c.	☐	☒	☐	Does the project site have more than 75 dwelling units on a single access in a high fire hazard area?
d.	☐	☐	☒	Is the project site located in an area having inadequate water and pressure to meet fire flow standards? *New public water system required.*
e.	☐	☒	☐	Is the project site located in close proximity to potential dangerous fire hazard conditions/uses (such as refineries, flammables, explosives manufacturing)? *Adjacent to Fire Zone 4*
f.	☐	☒	☐	Does the proposed use constitute a potentially dangerous fire hazard?
g.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

☒ Water Ordinance No. 7834 ☒ Fire Ordinance No. 2947 ☒ Fire Regulation No. 8

☐ Fuel Modification/Landscape Plan

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Project Design ☐ Compatible Use

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be impacted by **fire hazard** factors?

☐ Potentially significant ☐ Less than significant with project mitigation ☒ Less than significant/No impact

HAZARDS - 4. Noise

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Is the project site located near a high noise source (airports, railroads, freeways, industry)?
				Site is adjacent to SR-126
b.	☒	☐	☐	Is the proposed use considered sensitive (school, hospital, senior citizen facility) or are there other sensitive uses in close proximity?
				There are residential and school components in this tract map
c.	☐	☐	☒	Could the project substantially increase ambient noise levels including those associated with special equipment (such as amplified sound systems) or parking areas associated with the project?
				The tract map will include commercial activities.
d.	☒	☐	☐	Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels without the project?
				During construction period
e.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

☒ Noise Ordinance No. 11,778 ☐ Building Ordinance No. 2225--Chapter 35

☐ MITIGATION MEASURES / ☐ OTHER CONSIDERATIONS

☐ Lot Size ☐ Project Design ☐ Compatible Use

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be adversely impacted by **noise**?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 1. Water Quality

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Is the project site located in an area having known water quality problems and proposing the use of individual water wells?
				Santa Clara River is impaired waterway; groundwater is proposed water resource
b.	☐	☒	☐	Will the proposed project require the use of a private sewage disposal system?
	☐	☐	☐	If the answer is yes, is the project site located in an area having known septic tank limitations due to high groundwater or other geotechnical limitations *or* is the project proposing on-site systems located in close proximity to a drainage course?
c.	☒	☐	☐	Could the project's associated construction activities significantly impact the quality of groundwater and/or storm water runoff to the storm water conveyance system and/or receiving water bodies?
				Grading and other earth movement during construction period.
d.	☒	☐	☐	Could the project's post-development activities potentially degrade the quality of storm water runoff and/or could post-development non-storm water discharges contribute potential pollutants to the storm water conveyance system and/or receiving bodies?
				Urban runoff
e.	☒	☐	☐	Other factors? *Domestic water for the site, which will be supplied by the Valencia Water Company, is a blend of imported water and groundwater withdrawn primarily from Alluvial and Saugus aquifers. Some remediation efforts by federal and state agencies are underway.*

STANDARD CODE REQUIREMENTS

☐ Industrial Waste Permit ☒ Health Code Ordinance No. 7583, Chapter 5

☒ Plumbing Code Ordinance No. 2269 ☒ NPDES Permit Compliance (DPW)

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be impacted by, **water quality** problems?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 2. Air Quality

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Will the proposed project exceed the State's criteria for regional significance (generally (a) 500 dwelling units for residential uses or (b) 40 gross acres, 650,000 square feet of floor area or 1,000 employees for nonresidential uses)? *1,444 dwelling units and a maximum of 1,353,000 square feet of non-residential mixed-used space*
b.	☒	☐	☐	Is the proposal considered a sensitive use (schools, hospitals, parks) and located near a freeway or heavy industrial use? *An elementary school will be located near SR-126.*
c.	☒	☐	☐	Will the project increase local emissions to a significant extent due to increased traffic congestion or use of a parking structure, or exceed AQMD thresholds of potential significance per Screening Tables of the CEQA Air Quality Handbook? *Project exceeds regional threshold*
d.	☒	☐	☐	Will the project generate or is the site in close proximity to sources which create obnoxious odors, dust, and/or hazardous emissions? *Project is adjacent to SR-126, Chiquita Canyon Landfill north of the site*
e.	☐	☐	☒	Would the project conflict with or obstruct implementation of the applicable air quality plan? *Santa Clarita Valley is a non-attainment area*
f.	☒	☐	☐	Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation? *South Coast Air Basin is a non-attainment area.*
g.	☒	☐	☐	Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?
h.	☒	☐	☐	Other factors: *Construction impacts from 7,000,000 c.y. of fill*

STANDARD CODE REQUIREMENTS

☐ Health and Safety Code Section 40506

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Project Design ☒ Air Quality Report including toxic emission analysis for diesel particulates

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be impacted by, **air quality**?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 3. Biota

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Is the project site located within a Significant Ecological Area (SEA), SEA Buffer, or coastal Sensitive Environmental Resource (ESHA, etc.), or is the site relatively undisturbed and natural?
				Off-site improvement associated with this project is within SEA 23 Santa Clara River
b.	☒	☐	☐	Will grading, fire clearance, or flood related improvements remove substantial natural habitat areas?
				7,000,000 cubic yards of fill to come from within Specific Plan area
c.	☒	☐	☐	Is a major drainage course, as identified on USGS quad sheets by a blue, dashed line, located on the project site?
				Santa Clara River
d.	☒	☐	☐	Does the project site contain a major riparian or other sensitive habitat (e.g., coastal sage scrub, oak woodland, sycamore riparian woodland, wetland, etc.)?
				Southern willow riparian habitat
e.	☒	☐	☐	Does the project site contain oak or other unique native trees (specify kinds of trees)?
				Coast Live Oaks, cottonwood trees
f.	☒	☐	☐	Is the project site habitat for any known sensitive species (federal or state listed endangered, etc.)? *Least Bell's vireo, San Fernando Valley Spineflower in borrow site area; SEA 23 is habitat for unarmored threespine stickleback.*
g.	☒	☐	☐	Other factors (e.g., wildlife corridor, adjacent open space linkage)?
				Santa Clara River

☒ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design ☒ Oak Tree Permit ☒ SEATAC Review

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on **biotic resources**?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 4. Archaeological / Historical / Paleontological

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Is the project site in or near an area containing known archaeological resources or containing features (drainage course, spring, knoll, rock outcroppings, or oak trees) which indicate potential archaeological sensitivity? *CA-LAN-2234*
b.	☒	☐	☐	Does the project site contain rock formations indicating potential paleontological resources? *Portion of Long Canyon under consideration as a borrow site is underlain by the Saugus Formation, which is considered to contain a diverse assemblage of marine and non-marine vertebrate fossils in the Santa Clarita Valley*
c.	☐	☒	☐	Does the project site contain known historic structures or sites? *Site is vacant except for several storage sheds*
d.	☐	☐	☒	Would the project cause a substantial adverse change in the significance of a historical or archaeological resource as defined in 15064.5? *CA-lan-2234 may be impacted.*
e.	☐	☐	☒	Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? *The construction of a borrow site may destroy a unique paleontological resource*
f.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design ☒ Phase I Archaeology Report

CONCLUSION

Considering the above information, could the project leave a significant impact (individually or cumulatively) on **archaeological, historical**, or **paleontological** resources?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 5.Mineral Resources

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☐	☒	Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? *Oil extraction activities in portions of the site.*
b.	☐	☒	☐	Would the project result in the loss of availability of a locally important mineral resource discovery site delineated on a local general plan, specific plan or otherland use plan?
c.	☒	☐	☐	Other factors? *Project site has been previously used for oil extraction*

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design

CONCLUSION

Considering the above information, could the project leave a significant impact (individually or cumulatively) on **mineral** resources?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 6. Agriculture Resources

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?
				Portions of the tract are prime farmland
b.	☐	☒	☐	Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?
c.	☒	☐	☐	Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?
				Site is currently used for agricultural purposes
d.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design

CONCLUSION

Considering the above information, could the project leave a significant impact (individually or cumulatively) on **agriculture** resources?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 7. Visual Qualities

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Is the project site substantially visible from or will it obstruct views along a scenic highway (as shown on the Scenic Highway Element), or is it located within a scenic corridor or will it otherwise impact the viewshed? *Project is located along the Santa Clara River/SR-126 view corridor*
b.	☒	☐	☐	Is the project substantially visible from or will it obstructviews from a regional riding or hiking trail? *Santa Clara River trail*
c.	☒	☐	☐	Is the project site located in an undeveloped or undisturbed area, which contains unique aesthetic features? *Area along SR-126 has view of river and mesas to south*
d.	☒	☐	☐	Is the proposed use out-of-character in comparison to adjacent uses because of height, bulk, or other features? *Site is surrounded by vacant land currently undeveloped*
e.	☒	☐	☐	Is the project likely to create substantial sun shadow, light or glare problems? *New buildings may have night lighting and glare surfaces*
f.	☐	☐	☐	Other factors (e.g., grading or land form alteration):

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☒ Project Design ☒ Visual Report ☐ Compatible Use

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on **scenic** qualities?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

SERVICES - 1. Traffic/Access

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Does the project contain 25 dwelling units, or more and is it located in an area with known congestion problems (roadway or intersections)? *1,444 residential units, a maximum of 1,353,000 square feet of non-residential mixed-used space, and a 45,000 sq.ft. school*
b.	☐	☐	☒	Will the project result in any hazardous traffic conditions? *New circulation patterns*
c.	☐	☒	☐	Will the project result in parking problems with a subsequent impact on traffic conditions? *Sufficient parking spaces will be provided according to applicable codes*
d.	☐	☒	☐	Will inadequate access during an emergency (other than fire hazards) result in problems for emergency vehicles or residents/employees in the area?
e.	☒	☐	☐	Will the congestion management program (CMP) Transportation Impact Analysis thresholds of 50 peak hour vehicles added by project traffic to a CMP highway system intersection or 150 peak hour trips added by project traffic to a mainline freeway link be exceeded? *Project exceeds CMP thresholds for residential and commercial development*
f.	☐	☐	☒	Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? *To be analyzed in the DEIR on Specific Plan consistency*
g.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Project Design ☒ Traffic Report ☒ Consultation with Traffic & Lighting Division

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the physical environment due to **traffic/access** factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

SERVICES - 2. Sewage Disposal

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	If served by a community sewage system, could the project create capacity problems at the treatment plant? *Site currently is not serviced by any existing sewage system and treatment plant. Although a 6.8-mgd water reclamation plant servicing the area is proposed in the Newhall Ranch Specific Plan, it will not be completed prior to development of this tract. Interim plan for sewage treatment is necessary and its associated impacts will need to be analyzed.*
b.	☒	☐	☐	Could the project create capacity problems in the sewer lines serving the project site? *Same as above*
c.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

☐ Sanitary Sewers and Industrial Waste Ordinance No. 6130

☐ Plumbing Code Ordinance No. 2269

☐ MITIGATION MEASURES / ☐ OTHER CONSIDERATIONS

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the physical environment due to **sewage disposal** facilities?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

SERVICES - 3. Education

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Could the project create capacity problems at the district level? *Castaic Union School and William S. Hart Union High School Districts currently operate over capacity. And schools to be constructed within the SP will not be in place prior to development of the tract map. Therefore, interim impacts are to be analyzed.*
b.	☒	☐	☐	Could the project create capacity problems at individual schools which will serve the project site? *Interim impact to be analyzed.*
c.	☒	☐	☐	Could the project create student transportation problems? *No transportation currently exists; interim student transportation problems will occur before elementary, junior high, and high schools are constructed to adequately serve the Specific Plan area.*
d.	☒	☐	☐	Could the project create substantial library impacts due to increased population and demand? *The development of the tract will create new demand to existing library services*
e.	☒	☐	☐	Other factors? *The tract map includes a 7-acre elementary school*

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☒ Site Dedication ☒ Government Code Section 65995 ☒ Library Facilities Mitigation Fee

The applicant has school mitigation agreements with both effected school districts

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) relative to **educational** facilities/services?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

SERVICES - 4. Fire/Sheriff Services

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☐	☒	Could the project create staffing or response time problems at the fire station or sheriff's substation serving the project site? *According to the Specific Plan, three fire stations will be funded by the applicant per Newhall Ranch Specific Plan and two of them are within the Specific Plan area. However, these fire stations will not be in place in time before this first-phase development within the Specific Plan. The closest existing fire station is Fire Station 76 located at 27223 Henry Mayo Drive, less than 1 mile from the site. The nearest sheriff station is located at 23740 Magic Mountain Parkway. However, SP DEIR indicates that project specific impacts on sheriff department's services are to be determined at the time of project proposal. Therefore, this factor needs to be analyzed in this EIR.*
b.	☐	☐	☒	Are there any special fire or law enforcement problems associated with the project or the general area? *New residential area to be covered.*
c.	☐	☐	☐	Other factors?

☒ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☒ Fire Mitigation Fees

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) relative to **fire/sheriff** services?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

SERVICES - 5. Utilities/Other Services

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☐	☒	Is the project site in an area known to have an inadequate public water supply to meet domestic needs or to have an inadequate ground water supply and proposes water wells? *DMS does not provide assessment of water supply and demand for the Valencia Water Company level. The EIR needs to demonstrate that there is sufficient water for the tract map.*
b.	☐	☐	☒	Is the project site in an area known to have an inadequate water supply and/or pressure to meet fire fighting needs? *See above*
c.	☐	☒	☐	Could the project create problems with providing utility services, such as electricity, gas, or propane? *Gas Company and Edison's current infrastructure is capable of serving the entire SP at its build-out.*
d.	☒	☐	☐	Are there any other known service problem areas (e.g., solid waste)? *Newhall SP at its build-out will have unavoidable impacts on solid waste facilities. Provide project specific analysis and mitigation measures in the EIR.*
e.	☒	☐	☐	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services or facilities (e.g., fire protection, police protection, schools, parks, roads)? *No public infrastructure currently exists in project area.*
f.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

☐ Plumbing Code Ordinance No. 2269 ☐ Water Code Ordinance No. 7834

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) relative to **utilities/services**?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

OTHER FACTORS - 1. General

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Will the project result in an inefficient use of energy resources?
b.	☒	☐	☐	Will the project result in a major change in the patterns, scale, or character of the general area or community?
c.	☒	☐	☐	Will the project result in a significant reduction in the amount of agricultural land?
d.	☐	☐	☐	Other factors?

Site is currently vacant and high intensity uses are proposed

See discussion under "Agriculture" resource.

STANDARD CODE REQUIREMENTS

☐ State Administrative Code, Title 24, Part 5, T-20 (Energy Conservation)

☐ MITIGATION MEASURES / ☐ OTHER CONSIDERATIONS

☐ Lot size ☐ Project Design ☐ Compatible Use

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the physical environment due to any of the above factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

OTHER FACTORS - 2. Environmental Safety

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Are any hazardous materials used, transported, produced, handled, or stored on-site?
b.	☒	☐	☐	Are any pressurized tanks to be used or any hazardous wastes stored on-site? *Propane and other pressurized tanks may be used within commercial areas*
c.	☐	☒	☐	Are any residential units, schools, or hospitals located within 500 feet and potentially adversely affected?
d.	☒	☐	☐	Have there been previous uses which indicate residual soil toxicity of the site? *Site contain several abandoned oil wells*
e.	☐	☒	☐	Would the project create a significant hazard to the public or the environment involving the accidental release of hazardous materials into the environment?
f.	☐	☒	☐	Would the project emit hazardous emissions or handle hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?
g.	☒	☐	☐	Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or environment? *Site is within the Exxon Castaic Junction Oil Field.*
h.	☐	☒	☐	Would the project result in a safety hazard for people in a project area located within an airport land use plan, within two miles of a public or public use airport, or within the vicinity of a private airstrip?
i.	☐	☒	☐	Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?
j.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Toxic Clean up Plan

CONCLUSION

Considering the above information, could the project have a significant impact relative to **public safety**?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

OTHER FACTORS - 3. Land Use

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Can the project be found to be inconsistent with the plan designation(s) of the subject property? *Project requires Specific Plan Amendment*
b.	☐	☒	☐	Can the project be found to be inconsistent with the zoning designation of the subject property?
c.				Can the project be found to be inconsistent with the following applicable land use criteria:
	☐	☒	☐	Hillside Management Criteria?
	☐	☐	☒	SEA Conformance Criteria?
	☒	☐	☐	Other? *Resource Management Plan Conformance*
d.	☐	☒	☐	Would the project physically divide an established community?
e.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the physical environment due to **land use** factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

OTHER FACTORS - 4. Population/Housing/Employment/Recreation

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Could the project cumulatively exceed official regional or local population projections?
b.	☐	☒	☐	Could the project induce substantial direct or indirect growth in an area (e.g., through projects in an undeveloped area or extension of major infrastructure)?
c.	☐	☒	☐	Could the project displace existing housing, especially affordable housing? *Site is vacant*
d.	☐	☒	☐	Could the project result in a substantial job/housing imbalance or substantial increase in Vehicle Miles Traveled (VMT)?
e.	☒	☐	☐	Could the project require new or expanded recreational facilities for future residents? *New recreational facilities are required for the development of the SP. The facilities to be provided for the tract map are to be identified and analyzed in the EIR.*
f.	☐	☒	☐	Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?
g.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the physical environment due to **population, housing, employment**, or **recreational** factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

MANDATORY FINDINGS OF SIGNIFICANCE

Based on this Initial Study, the following findings are made:

	Yes	No	Maybe	
a.	☒	☐	☐	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?
				Biota
b.	☒	☐	☐	Does the project have possible environmental effects which are individually limited but cumulatively considerable? "Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.
				Soild Waste
c.	☒	☐	☐	Will the environmental effects of the project cause substantial adverse effects on human beings, either directly or indirectly?
				Water quality, air quality, noise

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the environment?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

PROJECT NO. 00-196

CASE NO. TR53108

URBAN SERVICES ANALYSIS
WATER CAPACITY ANALYSIS

7/22/2003

WATER AVAILABILITY EVALUATION

(ACRE-FEET/YEAR)

DEMAND

POTENTIAL

WATER COMPANY	EXISTING DEMAND	RECORDED	APPROVED	PENDING	PROJEC	TOTAL	DRY SUPPLY	NORMAL SUPPLY	POTENTIAL SIGNIFICANT IMPACT
VALENCIA WC	22,735	2,895.06	4,973.30	1,332.70	593.27	32,529.32			
SC VALLEY WIDE	64,350	5,983.81	9,372.36	7,044.56	593.27	87,343.99	90,600	96,000	NO

SANTA CLARITA VALLEY WIDE FUTURE SUPPLY

YEAR			
2004	90,600	96,000	NO
2005	90,600	96,000	NO
2006	90,600	96,000	NO
2007	90,600	96,000	NO

CRITERIA

DEMAND FACTORS (AF/YR):	SF	MF	MH	COMMERCIAL (PER ACRE)	INDUSTRIAL (PER ACRE)
VALENCIA WC	0.56	0.30	0.09	2.77	3.14

Note:

Dry Supply - Ranges from 90,600 to 147,500 acre-feet-per year.

Conjunctive-use and groundwater banking supplies are not included in table.

Normal Supply - Ranges from 96,000 to 151,900 acre-feet-per year.

URBAN SERVICES ANALYSIS

FIRE PROTECTION ANALYSIS

7/22/2003

PROJECT NO. 00-196
CASE NO. TR53108

RESPONSE DISTANCE EVALUATION (MILES)

MAXIMUM DISTANCE CRITERIA

Lot Type	Residential	Commercial Industrial	Approximate Distance	Potential Significant Impact
COMMERCIAL		1.5	0.5	No
MULTIPLE FAMILY	1.5		0.5	No
SINGLE FAMILY	1.5		0.5	No

PROJECT NO. 00-196
CASE NO. TR53108

URBAN SERVICES ANALYSIS

SCHOOL CAPACITY ANALYSIS

7/22/2003

STUDENT EVALUATION

SCHOOL DISTRICT	ENROLLMENT	PENDING	APPROVED	RECORDED	PROJEC	TOTAL	CAPACITY	STUDENT OVERLOAD	POTENTIAL SIGNIFICANT IMPACT
CASTAIC UNION EL	1,135	722	206	644	216	2,923	1,430	1,493	YES
CASTAIC UNION JH	1,350	380	152	452	119	2,453	1,800	653	YES
WM.S. HART SR HI	9,903	1,575	2,811	1,680	156	16,125	9,512	6,613	YES

URBAN SERVICES ANALYSIS

LIBRARY CAPACITY ANALYSIS

PROJECT NO 00-196
CASE NO. TR53108

7/22/2003

LIBRARY	EXISTING DEMAND	DEMAND POTENTIAL RECORDED	APPROVED	PENDING	PROJECT	TOTAL	SUPPLY	POTENITAL SIGNIFICANT IMPACT
VALENCIA								
VOLUMES	174,090	34,039	37,995	26,246	8,924	281,294	211,688	YES
SPACE (SQ FT)	33,861	6,621	7,390	5,105	1,736	54,712	23,966	YES
-AREA CLUSTER-*								
VOLUMES	320,598	68,901	126,506	68,882	8,924	593,811	348,467	YES
SPACE (SQ FT)	62,356	13,401	24,605	13,398	1,736	115,496	67,777	YES

* AREA CLUSTER IS THE GROUP OF LIBRARIES SERVING THE ENTIRE COMMUNITY.

	CRITERIA
VOLUMES PER CAPITA:	2
SQUARE FOOT PER CAPITA:	0.389

Tuesday, July 22, 2003

URBAN SERVICES ANALYSIS

SEWER TREATMENT CAPACITY ANALYSIS

(MILLION GALLONS PER DAY)

7/22/2003

PROJECT NO. 00-196

CASE NO: TR53108

SEWER AGENCY	EXISTING DEMAND	RECORDED	APPROVED	PENDING	PROJECT	TOTAL	SUPPLY	POTENTIAL SIGNIFICANT IMPACT
S.D. NO. 26 & 32	15.04	3.01	5.19	3.22	0.34	26.80	19.10	YES

PLANNED EXPANSION

SEWER AGENCY	TOTAL CAPACITY	COMPLETION EXPECTED	POTENTIAL SIGNIFICANT IMPACT
S.D. NO. 26 & 32			
FIRST STAGE	28.10	2002	NO
PRACTICAL SITE CAPACITY:	34.10	2010	NO

CRITERIA

DEMAND FACTORS (GAL/DAY):	SF	MF	MH	COMMERCIAL (PER ACRE)	INDUSTRIAL (PER ACRE)
S.D. NO. 26 & 32	260	195	156	1,440	2,009

APPENDIX C

Management and Mitigation Plans

Newhall Ranch Specific Plan Mitigation and Monitoring Plan
and
Water Reclamation Plant Mitigation and Monitoring Plan

Appendix C
2

MITIGATION MONITORING PLAN
(Newhall Ranch Specific Plan)

INTRODUCTION The Mitigation Monitoring Program describes the procedures the applicant and others will use to implement the mitigation measures adopted in connection with the approval of the Specific Plan and Water Reclamation Plant and the methods of monitoring such actions. A Monitoring Program is necessary only for impacts which would be significant if not mitigated. The following consists of a monitoring program table noting the responsible agency for mitigation monitoring, the schedule and a list of all Specific Plan-related mitigation measures.

PURPOSE *The Mitigation Monitoring Program (MMP) has been prepared in conformance with Section 21081.6 of the California Environmental Quality Act. It is the intent of this program to (1) verify satisfaction of the required mitigation measures of the EIR; (2) provide a methodology to document implementation of the required mitigation; (3) provide a record of the Monitoring Program; (4) identify monitoring responsibility; (5) establish administrative procedures for the clearance of mitigation measures; (6) establish the frequency and duration of monitoring; and (7) utilize existing review processes wherever feasible.*

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES			
4.1-1. The standard building setbacks from ascending and descending man-made slopes are to be followed in accordance with Section 1806.4 of the Los Angeles County Building Code, unless superseded by specific geologic and/or soils engineering evaluations. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 44)	Applicant (Civil Engineer, Geotechnical Engineer, Engineering Geologist)	Building and Grading Plan Check	1. LACDPW, Geology/Soils Section, and Building and Safety 2. LACDPW, Building and Safety and Geology/Soils Section 3. Prior to Issuance of Building Permits

ACOE - U.S. Army Corps of Engineers
CIWMB - California Integrated Waste Management Board
CSDLAC - County Sanitation Districts of Los Angeles County
FCD - Flood Control Division
LACFPD - Los Angeles County Fire Protection District
LACDPW - Los Angeles County Department of Public Works
RWQCBLAR - Regional Water Quality Control Board, Los Angeles Region
SCAQMD - South Coast Air Quality Management District
USFWS - U.S. Fish and Wildlife Service

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
4.1-2. The existing Grading Ordinance for planting and irrigation of cut-slopes and fill slopes is to be adhered to for grading operations within the project site. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 44)	Applicant (Civil Engineer)	Field Verification	1. LACDPW, Building and Safety 2. LACDPW, Building and Safety 3. Prior to Issuance of Occupancy Permits
4.1-3. In order to safeguard against major seismic-related structural failures, all buildings within the project boundaries are to be constructed in conformance with the Los Angeles County Uniform Building Code, as applicable.	Applicant (Project Structural Engineer)	Building Plan Check	1. LACDPW, Building and Safety 2. LACDPW, Building and Safety 3. Prior to Issuance of Building Permits
MITIGATION FOR GEOLOGIC HAZARDS			
4.1-4. The location and dimensions of the exploratory trenches and borings undertaken by Allan E. Seward Engineering Geology, Inc. and R.T. Frankian & Associates are to be noted on all grading plans relative to future building plans, unless the trenches and/or borings are removed by future grading operations. If future foundations traverse the trenches or borings, they are to be reviewed and approved by the project Geotechnical Engineer. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 45)	Applicant (Geotechnical Engineer)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plans; grading
4.1-5. Wherever the Pacoima Formation is exposed, it may be potentially expansive; therefore, it is to be tested by the project Soils Engineer at the grading plan stage to determine its engineering characteristics and mitigation requirements, as necessary.	Applicant (Geotechnical Engineer)	Grading Plan Check	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plans
4.1-6. Should any expansive soils be encountered during grading operations, they are not to be placed nearer the finished surface than 8 feet below the bottom of the subgrade elevation. This depth is subject to revision depending upon the expansive potential measured during grading. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer) Grading Contractor	Field Investigation	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. During Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
4.1-7. If expansive materials are encountered at subgrade elevation in cut areas, the soils are to be removed to a depth of 8 feet below the "finished" or "subgrade" surface and the excavated area backfilled with nonexpansive, properly compacted soils. This depth is subject to revision depending upon the expansive potential measured during grading. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Investigation	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. During Grading
4.1-8. At the time of subdivision, which allows construction, areas subject to liquefaction are to be mitigated to the satisfaction of the project Geotechnical Engineer prior to site development. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Issuance of Grading Permit(s)
4.1-9. Subdrains are to be placed in areas of high ground water conditions (Potrero Canyon, in particular) or wherever extensive irrigation is planned. The systems are to be designed to the specifications of the Newhall Ranch Specific Plan Geotechnical Engineer.	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Issuance of Grading Permit and Verify During Grading
4.1-10. Subdrains are to be placed in the major and minor canyon fills, behind stabilization blankets, buttress fills, and retaining walls, and as required by the Geotechnical Engineer during grading operations. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Issuance of Grading Permit and Verify During Grading
4.1-11. Canyon subdrains may be installed in "V"-ditches or in a rectangular trench excavated to expose competent material or bedrock as approved by the Geotechnical Engineer.	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Issuance of Grading Permit and Verify During Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
4.1-12. The vertical spacing of subdrains behind buttress fills, stabilization blankets, etc., are to be a maximum of 15 feet. The gradient is to be at least 2 percent to the discharge end. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Issuance of Grading Permit and Verify During Grading
4.1-13. Geological materials subject to hydroconsolidation (containing significant void space) are to be removed prior to the placement of fill. Specific recommendations relative to hydroconsolidation are to be provided by the project Geotechnical Engineer at the subdivision stage. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 44)	Applicant (Geotechnical Engineer and Engineering Geologist)	Receipt of Specific Hydro-consolidation Recommend-ations Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plans and Verify During Grading
4.1-14. Proposed structures on ridgelines will have a minimum 20-foot horizontal setback from the margin of the bedrocks to prevent perched or ground water levels where relatively impermeable materials can block downward migration.	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section, and Building and Safety 2. LACDPW, Building and Safety 3. Prior to Issuance of Grading Permits and Verify during Grading
4.1-15. Subsurface exploration is required to delineate the depth and lateral extent of the landslides shown on the geologic map. This work shall be undertaken at the subdivision stage. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 15) Landslides must be mitigated through stabilization, removal, and/or building setbacks as determined by the Newhall Ranch Specific Plan Geotechnical Engineer, and to the satisfaction of the Los Angeles County Department of Public Works.	Applicant (Geotechnical Engineer and Engineering Geologist)	Receipt of Exploratory Data and Mitigation Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plan and Verify During Grading
4.1-16. At the subdivision stage, the existence of landslides designated with "3" on Figure 4.1-2, Existing Landslide Areas, and within or adjacent to the development area is to be confirmed. (Allan E. Seward Engineering Geology, Inc., 19 September 1994,p. 15) If landslides are confirmed in these areas, they are to be mitigated through stabilization, removal, and/or building setbacks as determined by the Newhall Ranch Specific Plan Geotechnical Engineer.	Applicant (Geotechnical Engineer)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plan and Verify During Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
4.1-17. The existence, or lack thereof, of landslides on or adjacent to the roadway alignments for the extension of Magic Mountain Parkway and Valencia Boulevard will be evaluated by subsurface investigations at the subdivision stage. (Allan E. Seward Engineering Geology, Inc., 13 December 1995, p. 11) If landslides are confirmed in these areas, they are to be mitigated through stabilization, removal, and/or building setbacks as determined by the Newhall Ranch Specific Plan Geotechnical Engineer.	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plan and Verify During Grading
4.1-18. The potential hazards associated with debris flow scars and other possible surficial failures located in proximity to the roadway alignments for the extension of Magic Mountain Parkway and Valencia Boulevard will be evaluated at the subdivision stage. (Allan E. Seward Engineering Geology, Inc., 13 December 1995, p. 11) These areas are to be mitigated as determined by the Newhall Ranch Specific Plan Geotechnical Engineer.	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plan and Verify During Grading
4.1-19. Remove debris from surficial failures during grading operations prior to the placement of fill. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 16)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. During Grading Operations
4.1-20. All soils and/or unconsolidated slopewash and landslide debris is to be removed prior to the placement of compacted fills. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 45)	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to approval of Final Grading Plan and During Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
4.1-21. Cut-slopes, which will expose landslide material, are to undergo geologic and geotechnical evaluation at the subdivision stage to determine their stability and degree of consolidation. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 15) Several options are available to mitigate potential landslide failure in the proposed cut-slopes. Landslides may be stabilized with buttress fills or shear keys designed by the Newhall Ranch Specific Plan Geotechnical Engineer; landslide material can be entirely removed and replaced with a stability fill; or the slope can be redesigned to avoid the landslide. Landslides underlying cut pad or road areas may be removed or partially removed if the Newhall Ranch Specific Plan Geologist and Geotechnical Engineer conclude that the landslide is stable and sufficiently consolidated to build on. Landslides located on ascending natural slopes above proposed graded areas will also require evaluation for stability. Unstable landslides on natural slopes above graded areas will either require stabilization, removal or building setbacks to mitigate potential hazards.	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plan and During Grading
4.1-22. Additional geologic investigations are required prior to approval of future tentative maps which allow construction, or grading plans to determine the geologic and geotechnical feasibility of the fifteen (15) lots proposed in the High Country SMA.	Applicant (Geotechnical Engineer)	Grading Plan Check	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Tentative Maps for the 15 Estate Residential Lots
4.1-23. Prior to construction of the road embankment located within landslide Qls II, a compacted fill shear key will be constructed at the property boundary. (R.T. Frankian & Associates, 19 September 1994, p. 6)	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section, and Building and Safety 2. LACDPW, Building and Safety 3. Prior to Construction of the Road Embankment and Verify During Grading
4.1-24. Landslides, which will not affect the proposed grading concept, are to be placed in Restricted Use Areas on the Final Maps. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 43)	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
4.1-25. Surficial stability of cut-slopes designated with a "G" are to be fully evaluated at the subdivision stage, due to the possibility of wedge failures or surficial material in the slope. Corrective grading measures are to be presented in detail as mitigation at both the subdivision and Grading Plan stages of development. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, pp. 17, 43)	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plans and During Grading
4.1-26. Cut slopes designated as "P" are potentially unstable and are to be fully evaluated at the subdivision stage to ascertain whether they are stable as designed. Corrective grading measures are to be presented in detail as mitigation at both the subdivision and Grading Plan stages of development. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, pp. 17, 43)	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plans and During Grading
4.1-27. Cut-slopes designated with a "U" are to be further investigated at the subdivision stage to confirm underlying geologic conditions and slope stability. Corrective grading measures are to be presented in detail as mitigation at both the subdivision and Grading Plan stages of development. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, pp. 17, 43)	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plans and During Grading
4.1-28. Cut-slopes associated with the construction of the proposed extensions of Magic Mountain Parkway and Valencia Boulevard are to be further investigated at the subdivision stage to confirm the underlying geologic conditions and slope stability. Corrective measures are to be required if it is determined that the cut-slopes will not be stable. (Allan E. Seward Engineering Geology, Inc., 13 December 1995, pp. 11 & 12)	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plans and During Grading

According to Allan E. Seward Engineering Geology, Inc., unstable cut-slopes can either be redesigned or stabilized using various corrective grading techniques. Redesign options for unstable cut-slopes include reorientation, relocation and reducing the proposed slope gradient. Options for corrective grading include the construction of buttress fills, stability fills, shear keys, and complete removal of the landslide material.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
4.1-29. Orientations of the bedrock attitudes are to be evaluated by the Newhall Ranch Specific Plan Engineering Geologist to identify locations of required buttress fills. Buttress fill design and recommendations, if necessary, are to be presented as mitigation during the grading plan stage. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer and Engineering Geologist)	Grading Plan Check Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. Prior to Approval of Final Grading Plans
4.1-30. All fills, unless otherwise specifically designed, are to be compacted to at least 90 percent of the maximum dry unit weight as determined by ASTM Designation D 1557-91 Method of Soil Compaction. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section 2. LACDPW, Geology/Soils Section 3. During Grading
4.1-31. No fill is to be placed until the area to receive the fill has been adequately prepared and approved by the Geotechnical Engineer. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-32. Fill soils are to be kept free of all debris and organic material. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-33. Rocks or hard fragments larger than 8 inches are not to be placed in the fill without approval of the Geotechnical Engineer, and in a manner specified for each occurrence. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-34. Rock fragments larger than 8 inches are not to be placed within 10 feet of finished pad grade or the subgrade of roadways or within 15 feet of a slope face. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
4.1-35. Rock fragments larger than 8 inches may be placed in windrows, below the limits given above, provided the windrows are spaced at least 5 feet vertically and 15 feet horizontally. Granular soil must be flooded around windrows to fill voids between the rock fragments. The granular soil is to be wheel rolled to assure compaction. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-36. The fill material is to be placed in layers which, when compacted, is not to exceed 8 inches per layer. Each layer is to be spread evenly and is to be thoroughly mixed during the spreading to insure uniformity of material and moisture. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-37. When moisture content of the fill material is too low to obtain adequate compaction, water is to be added and thoroughly dispersed until the soil is approximately 2 percent over optimum moisture content. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-38. When the moisture content of the fill material is too high to obtain adequate compaction, the fill material is to be aerated by blading or other satisfactory methods until the soil is approximately two percent over optimum moisture content. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-39. Where fills toe out on a natural slope or surface, a keyway, with a minimum width of 16 feet and extending at least 3 feet into firm, natural soil, is to be cut at the toe of the fill. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-40. Where the fills toe out on a natural or cut slope and the natural or cut slope is steeper than 5 horizontal to 1 vertical, a drainage bench with a width of at least 8 feet is to be established at the toe of the fill. Fills may be placed over cut slopes if the visible contact between the fill and cut is steeper than 45 degrees. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
4.1-41. When placing fills over slopes, sidewall benching is to extend into competent material, approved by the Geotechnical Engineer, with vertical benches not less than 4 feet. (R.T. Frankian & Associates, 19 September 1994, Appendix I) Competent material is defined as being free of loose soil, heavy fracturing or compressive soils.	Applicant (Geotechnical Engineer and Engineering Geologist)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-42. When constructing fill slopes, the grading contractor is to avoid spillage of loose material down the face of the slope during the dumping and compacting operations. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-43. The outer faces of fill slopes are to be compacted by backing a sheepsfoot compactor over the top of the slope, and thoroughly covering all of the slope surface with overlapping passes of the compactor. Compaction of the slope is to be repeated after each 4 feet of fill has been placed. The required compaction must be obtained prior to placement of additional fill. As an alternate, the slope can be overbuilt and cut back to expose a compacted core. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	Applicant (Geotechnical Engineer)	Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-44. All artificial fill associated with past petroleum activities as well as other existing artificial fill, are to be evaluated by the Newhall Ranch Specific Plan Geotechnical Engineer at the subdivision and/or Grading Plan Stage. (Allan E. Seward Engineering Geology, 19 September 1994, Inc., p. 45) Unstable fills are to be mitigated through removal, stabilization, or other means as determined by the Newhall Ranch Specific Plan Geotechnical Engineer.	Applicant (Geotechnical Engineer and Engineering Geologist)	Receipt of Geotechnical Evaluation Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. Prior to Approval of Final Subdivision Maps or Grading Plans, and Verify During Grading
4.1-45. Surface runoff from the future graded areas is not to run over any natural, cut, or fill slopes. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 20)	Applicant (Civil Engineer and Construction Superintendent)	Include this Measure in Specifications Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
4.1-46. Runoff from future pads and structures is to be collected and channeled to the street and/or natural drainage courses via non-erosive drainage devices. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 20)	Applicant (Civil Engineer and Construction Superintendent)	Include this Measure in Specifications Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-47. Water is not to stand or pond anywhere on the graded pads. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 20)	Applicant (Civil Engineer and Construction Superintendent)	Include this Measure in Specifications Field Verification	1. LACDPW, Geology/Soils Section, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. During Grading
4.1-48. Oil and water wells that might occur on site are to be abandoned in accordance with State and local regulations. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 45)	Applicant (Well abandonment Specialist)	Receipt of Confirmation of Abandonment	1. California Department of Conservation, Division of Oil and Gas, Building and Safety 2. LACDPW, Geology/Soils Section, Building and Safety 3. Prior to Issuance of Grading Permits
4.1-49. If any leaking or undocumented oil wells are encountered during grading operations, their locations are to be surveyed and the current well conditions evaluated immediately. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 21) Measures are to be taken to document the wells, abandonment, and remediate the well sites (if necessary) in accordance with State and local regulations.)	Applicant (Civil Engineer and Well Abandonment Specialist)	Include Measure in Specifications Field Documentation	1. California Department of Conservation, Division of Oil and Gas, Building and Safety 2. California Department of Conservation, Division of Oil and Gas, Building and Safety 3. During Grading
4.1-50. The exact status and location of the Exxon (Newhall Land & Farming) oil well #31 will be evaluated at the subdivision stage. If necessary, the well will be abandoned in accordance with State and local regulations. (Allan E. Seward Engineering Geology, Inc., 13 December 1995, p. 12)	Applicant (Civil Engineer and Well Abandonment Specialist)	Locate Well #31 on Tract Map Documentation of Abandonment, if applicable	1. California Department of Conservation, Division of Oil and Gas, Building and Safety 2. California Department of Conservation, Division of Oil and Gas, Building and Safety 3. Prior to Issuance of Grading Permit

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
MITIGATION FOR SEISMIC HAZARDS			
4.1-51. Survey control will be required to precisely locate the Salt Creek and Del Valle Faults at the subdivision stage. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 33)	Applicant (Civil Engineer and Engineering Geologist)	Receipt of Geotechnical Documentation	1. LACDPW, Geology Section 2. LACDPW, Geology Section 3. Prior to Tract Map/Site Plan Approvals as Applicable
4.1-52. Additional subsurface trenching will be performed within the Holser Structural Zone on Newhall Ranch during the subdivision stage to evaluate its existence. Within Potrero Canyon, additional subsurface evaluation will be performed during the subdivision stage to confirm that nontectonic alluvial movement was the cause of surface ground cracking during the January 17, 1994 earthquake, and to evaluate the potential for shallow-depth faults. (Allan E. Seward Engineering Geology, Inc. 19 September 1994, p. 42, as revised above)	Applicant (Engineering Geologist)	Receipt of Geotechnical Documentation	1. LACDPW, Geology Section 2. LACDPW, Geology Section 3. Prior to Tract Map/Site Plan Approvals as Applicable
No distinct evidence for Holocene activity on any of the faults traversing the Newhall Ranch Specific Plan site was observed during Allan E. Seward Engineering Geology, Inc.'s investigation; however, based on the distinct nature of faulting, the possible association of minor seismic activity, and compatible orientation of the faulting in relation to the current stress regime of the Transverse Ranges, preliminary Building Setback Zones have been designated around the mapped fault zones (see Figure 4.1-4).			
4.1-53. Precise Building Setback Zones for the Newhall Ranch Specific Plan site are to be defined at the subdivision stage.	Applicant (Civil Engineer and Engineering Geologist)	Setback Zones Identified on Tract Maps/Site Plans	1. LACDPW, Geology Section, and Building and Safety 2. LACDPW, Geology Section, and Building and Safety 3. Prior to Tract Map and Site Plan and Final Map Approvals, as Applicable
4.1-54. Due to the potential activity of the Salt Creek and Del Valle Faults, site development is to remain outside of Building Setback Zones around fault traces, and the possible fault zone connecting them (see Figure 4.1-4). (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 42) The zone shown around the possible fault connecting the Del Valle and Salt Creek Faults may be deleted if future work shows that this fault segment does not exist.	Applicant (Civil Engineer and Engineering Geologist)	Setback Zones Identified on Tract Maps/Site Plans	1. LACDPW, Geology Section, and Building and Safety 2. LACDPW, Geology Section, and Building and Safety 3. Prior to Tract Map/Site Plan/Final Map Approvals, as Applicable

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.1 GEOTECHNICAL AND SOIL RESOURCES (cont.)			
4.1-55. To minimize potential hazards from shattered ridge effects, structures and storage tanks proposed on ridgelines are to have a minimum 20 foot setback from the margins of the bedrock. Designation of specific building setbacks will require evaluation at the subdivision stage. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 40) Building setback zones are to be identified on all site plans and tract maps for the site.	Applicant (Engineering Geologist)	Setback Zones Identified on Tract Maps/Site Plans	1. LACDPW, Geology Section, and Building and Safety 2. LACDPW, Geology Section, and Building and Safety 3. Prior to Tract Map/Site Plan Approvals, as Applicable
4.1-56. The potential for ground motion and ground failure associated with a seismic event in proximity to the planned roadway alignments of Magic Mountain Parkway and Valencia Boulevard will be evaluated at the subdivision stage. (Allan E. Seward Engineering Geology, Inc., 13 December 1995, p. 11) Mitigation to reduce associated significant impacts will also be identified at that time.	Applicant (Engineering Geologist)	Receipt of Geotechnical Report and Mitigation	1. LACDPW, Geology/Soils Section, and Building and Safety 2. LACDPW, Geology/Soils Section, and Building and Safety 3. Prior to Final Map Approval

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.2 FLOOD			
4.2-1. All on- and off-site flood control improvements necessary to serve the Newhall Ranch Specific Plan are to be constructed to the satisfaction of the County of Los Angeles Department of Public Works Flood Control Division.	Applicant (Civil Engineer)	Approval of Drainage Plans Field Verification	1. LACDPW, FCD 2. LACDPW, FCD 3. Prior to Issuance of Occupancy Permit(s)
4.2-2. All necessary permits or letters of exemption from the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, California Department of Fish and Game, and the Regional Water Quality Control Board for Specific Plan-related development are to be obtained prior to construction of drainage improvements. The performance criteria to be used in conjunction with 1603 agreements and/or 404 permits are described in Section 4.6, Biological Resources, **Mitigation Measures 4.6-1** through **4.6-10** (restoration) and **4.6-11** through **4.6-16** (enhancement).	Applicant	Receipt of all Necessary Permit(s)	1. ACOE, USFWS, CDFG, RWQCBLAR 2. ACOE, USFWS, CDFG, RWQCBLAR 3. Prior to Grading
4.2-3. All necessary streambed agreement(s) are to be obtained from the California Department of Fish and Game wherever grading activities alter the flow of streams under CDFG jurisdiction. The performance criteria to be used in conjunction with 1603 agreements and/or 404 permits are described in Section 4.6, Biological Resources, **Mitigation Measures 4.6-1** through **4.6-10** (restoration) and **4.6-11** through **4.6-16** (enhancement).	Applicant	Receipt of Streambed Agreements	1. CDFG 2. LACDPW, FCD 3. Prior to Grading
4.2-4. Conditional Letters of Map Revision (CLOMR) relative to adjustments to the 100-year FIA flood plain are to be obtained by the applicant after the proposed drainage facilities are constructed.	Applicant (Civil Engineer)	Receipt of CLOMR(s)	1. Federal Insurance Administration 2. LACDPW 3. Upon Completion of Facilities
4.2-5. Prior to the approval and recordation of each subdivision map, a Hydrology Plan, Drainage Plan, and Grading Plan (including an Erosion Control Plan if required) for each subdivision must be prepared by the applicant of the subdivision map to ensure that no significant erosion, sedimentation, or flooding impacts would occur during or after site development. These plans shall be prepared to the satisfaction of the County of Los Angeles Department of Public Works.	Applicant (Project Engineer)	Approval of Final Hydrology Plan, Final Drainage Plan, and Final Grading Plan	1. LACDPW, FCD and Geology/Soils Section 2. LACDPW, FCD and Geology/Soils Section 3. Prior to Recording of Each Subdivision Map
4.2 FLOOD (cont.)			
4.2-6. Install permanent erosion control measures, such as desilting and debris basins, drainage swales, slope drains, storm drain inlet/outlet protection, and sediment traps in order to prevent sediment and debris from the upper reaches of the drainage areas which occur on the Newhall Ranch site from entering storm drainage improvements. These erosion control measures shall be installed to the satisfaction of the County of Los Angeles Department of Public Works.	Applicant (Project Engineer)	Field Verification	1. LACDPW, FCD 2. LACDPW, FCD 3. Prior to Issuance of Occupancy Permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.2-7. The applicant for any subdivision map permitting construction shall satisfy all applicable requirements of the NPDES Program in effect in Los Angeles County to the satisfaction of the County of Los Angeles Department of Public Works. These requirements currently include preparation of an Urban Storm Water Mitigation Plan (USWMP) containing design features and Best Management Practices (BMPs) appropriate and applicable to the subdivision. In addition, the requirements currently include preparation of a Storm Water Management Pollution Prevention Plan (SWPPP) containing design features and BMPs appropriate and applicable to the subdivision. The County of Los Angeles Department of Public Works shall monitor compliance with those NPDES requirements.	Applicant (Construction Superintendent)	Submittal of USWMP and SWPPP to RWQCBLAR Field Verification	1. RWQCBLAR 2. LACDPW, Building and Safety 3. Prior to Grading and During Grading Operations
4.2-8. The applicant for any subdivision map permitting construction shall comply with all appropriate requirements of the County of Los Angeles Standard Urban Stormwater Mitigation Plan ("SUSMP") requirements, and comply with the SWRCB-issued General Permit for Construction Activity Storm Water (SWRCB Order 99-08-DWQ), as it may be amended from time to time or replaced by other applicable stormwater permits.	Applicant (Construction Superintendent)	Submittal of SUSMP to LACDPW Field Verification	1. LACDPW, FCD 2. LACDPW, FCD 3. Prior to Issuance of Occupancy Permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.3 CULTURAL/PALEONTOLOGICAL RESOURCES			
The following mitigation measures are derived from the Los Angeles County Environmental Document Reporting Procedures and Guidelines for paleontological resources and Appendix K of the CEQA *Guidelines* for the protection of cultural resources. Both documents require that reasonable efforts be made to reduce significant impacts on cultural resources to levels below identified thresholds of significance:			
4.3-1. Any adverse impacts to California-LAN-2133, -2235, and the northern portion of -2233 are to be mitigated by avoidance and preservation. Should preservation of these sites be infeasible, a Phase III data recovery (salvage excavation) operation is to be completed on the sites so affected, with archaeological monitoring of grading to occur during subsequent soils removals on the site. This will serve to collect and preserve the scientific information contained therein, thereby mitigating all significant impacts to the affected cultural resource.	Applicant (Archaeologist)	Qualified Archaeologist Present During Grading Activities of Sites	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to and During Grading Activities, as appropriate
4.3-2. Any significant effects to California-LAN-2241 are to be mitigated through site avoidance and preservation. Should this prove infeasible, an effort is to be made to relocate, analyze and re-inter the disturbed burial at some more appropriate and environmentally secure locale within the region.	Applicant (Archaeologist)	Qualified Archaeologist Present During Grading Activities of site if not located before	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to and During Grading Activities, as appropriate
4.3-3. In the unlikely event that additional artifacts are found during grading within the development area or future roadway extensions, an archaeologist will be notified to stabilize, recover and evaluate such finds.	Applicant (Archaeologist)	Include this Measure in Subdivision Map Conditions if appropriate	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. During Tentative Map Processing

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.3 CULTURAL/PALEONTOLOGICAL RESOURCES (cont.)			
4.3-4. As part of an inspection testing program, a Los Angeles County Natural History Museum-approved inspector is to be on site to salvage scientifically significant fossil remains. The duration of these inspections depends on the potential for the discovery of fossils, the rate of excavation, and the abundance of fossils. Geological formations (like the Saugus Formation) with a high potential will initially require full time monitoring during grading activities. Geologic formations (like the Quaternary terrace deposits) with a moderate potential will initially require half-time monitoring. If fossil production is lower than expected, the duration of monitoring efforts should be reduced. Because of known presence of microvertebrates in the Saugus Formation, samples of at least 2,000 pounds of rock shall be taken from likely horizons, including localities 13, 13A, 14, and 23. These samples can be stockpiled to allow processing later to avoid delays in grading activities. The frequency of these samples will be determined based on field conditions. Should the excavations yield significant paleontological resources, excavation is to be stopped or redirected until the extent of the find is established and the resources are salvaged. Because of the long duration of the Specific Plan, a reassessment of the paleontological potential of each rock unit will be used to develop mitigation plans for subsequent subdivisions. The report shall include an itemized inventory of the fossils, pertinent geologic and stratigraphic data, field notes of the collectors and include recommendations for future monitoring efforts in those rock units. Prior to grading, an agreement shall be reached with a suitable public, non-profit scientific repository, such as the Los Angeles County Museum of Natural History or similar institution, regarding acceptance of fossil collections.	Applicant (Archaeologist)	LA County Natural History Museum-Approved Inspector Present During Grading Activities	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. During Grading Activities in the Pico Formation, Saugus Formation, Quaternary Terrace Deposits, and Quaternary Older Alluvium
4.4 AGRICULTURAL RESOURCES			
4.4-1. Purchasers of homes located within 1,500 feet of an agricultural field or grazing area are to be informed of the location and potential effects of farming uses prior to the close of escrow.	Applicant	Include this Information in CC&Rs	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. At Home Sales
4.4-2. New homes within 1,500 feet of farming uses within Ventura County, if any, are to be informed that agricultural activities within Ventura County are protected under the County's right-to-farm ordinance, and are to be provided with copies of the County's Amended Ordinance 3730-5/7/85.	Applicant	Include this Information in CC&Rs	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. At Home Sales

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.5 ENVIRONMENTAL SAFETY			
4.5-1. All final school locations are to comply with the California State Board of Education requirement that no schools be sited within 100 feet from the edge of the right-of-way of 100-110 kV lines; 150 feet from 220-230 kV lines; and 250 feet from 345 kV lines.	Applicant	Tentative Tract Map Review	1. State Board of Education 2. LA County Department of Regional Planning 3. Prior to Approval of Tract Maps
4.5-2. Only non-habitable structures shall be located within SCE easements.	Applicant	Tentative Tract Map Review	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Approval of Tract Maps
4.5-3. Prior to issuance of grading permits, all abandoned oil and natural gas-related sites must be remediated to the satisfaction of the California Department of Oil and Gas, the Los Angeles County Hazardous Materials Control Program, the South Coast Air Quality Management District, and/or the Regional Water Quality Control Board (Los Angeles region).	Applicant/On-Site Oil and Natural Gas Producers	Confirmation that Oil- and Natural Gas-Related Sites are Satisfactorily Remediated	1. California Department of Conservation, Division of Oil and Gas; LA County Hazardous Materials Control Program; SCAQMD; and RWQCBLAR 2. California Department of Conservation, Division of Oil and Gas; LA County Hazardous Materials Control Program; SCAQMD; and RWQCBLAR 3. Prior to Issuance of Grading Permits
4.5-4. All on-going oil and natural gas operational sites adjacent to or in close proximity to residential, mixed-use, commercial, business park, schools, and local and Community Parks shall be secured by fencing and emergency access to these locations shall be provided.	Applicant/On-Site Oil and Natural Gas Producers	Field Verification	1. California Department of Conservation, Division of Oil and Gas 2. LACDPW, Building and Safety Department 3. Prior to Issuance of Building Permits
4.5-5. The Specific Plan is to meet the requirements of SCGC in terms of pipeline relocation, grading in the vicinity of gas mains, and development within Southern California Gas Company easements. These requirements would be explicitly defined by SCGC at the future tentative map stage.	Applicant (Civil Engineer)	Grading Plan Check	1. SCGC 2. LACDPW 3. Prior to Approval of Grading Plan

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.5 ENVIRONMENTAL SAFETY (cont.)			
4.5-6. All potential buyers or tenants of property in the vicinity of Southern California Gas Company transmission lines are to be made aware of the line's presence in order to assure that no permanent construction or grading occurs over and within the vicinity of the high-pressure gas mains.	Applicant	Include this Information in CC&Rs	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. At Home Sales
4.5-7. In accordance with the provisions of the Los Angeles County Building Code, Section 308(d), all buildings and enclosed structures that would be constructed within the Specific Plan located within 25 feet of oil or gas wells shall be provided with methane gas protection systems. Buildings located between 25 feet and 200 feet of oil or gas wells shall, prior to the issuance of building permits by the County of Los Angeles, be evaluated in accordance with the current rules and regulations of the State of California Division of Oil and Gas.	Applicant (Building Contractors)	Include this Requirement in Building Specifications Field Verification	1. California Department of Conservation, Division of Oil and Gas and LACDPW, Building and Safety 2. LACDPW, Building and Safety 3. Prior to Issuance of Occupancy Permits
4.5-8. In accordance with the provisions of the Los Angeles County Building Code, Section 308(c), all buildings and structures located within 1,000 feet of a landfill containing decomposable material (in this case the Chiquito Canyon Landfill) shall be provided with a landfill gas migration protection and/or control system.	Applicant (Building Contractors)	Include this Requirement in Building Specifications Field Verification	1. LACDPW, Building and Safety 2. LACDPW, Building and Safety 3. Prior to Issuance of Occupancy Permits
4.5-9. In accordance with the provisions of the Los Angeles County Code, Title 11, Division 4, Underground Storage of Hazardous Materials regulations, the County of Los Angeles Department of Public Works shall review, prior to the issuance of building permits by the County of Los Angeles, any plans for underground hazardous materials storage facilities (e.g., gasoline) that may be constructed or installed within the Specific Plan.	Applicant (Building Contractors)	Include this Requirement in Building Specifications Field Verification	1. LACDPW, Building and Safety 2. LACDPW, Building and Safety 3. Prior to Issuance of Occupancy Permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase

4.6 BIOTA

Development of the Newhall Ranch Specific Plan will result in impacts to biological resources, some of which are considered to be significant. However, the Specific Plan generally avoids areas of highest biological value, and concentrates development in lower quality areas. The mitigation measures presented below, if successfully implemented, would reduce the degree of many of these impacts to a level that is considered not significant.

Mitigation measures are separated into three categories. The first includes an overview of those design features that are incorporated as part of the Specific Plan to reduce the biological impact potential. The second category includes specific mitigation measures incorporated as part of the Resource Management Plan. The last category includes additional mitigation measures recommended as part of this Draft EIR. The specific mitigation measures in each of these categories are defined below.

SPECIFIC PLAN DESIGN MEASURES

The Specific Plan was designed to partially mitigate potential impacts to sensitive biological resources through avoidance in order to maximize the conservation of important biological features of the site. Specific elements of Specific Plan design that are intended to reduce impacts to plants, animals and habitat would be implemented through adoption and approval of the Specific Plan.

The habitat types and associated plant and wildlife species which occur on the property have become an integral part of the overall Specific Plan design, through the formulation of a conservation strategy that allows for the development of the site in a way that minimizes the effects to sensitive biological resources. In addition, this conservation strategy incorporates the design and management of important open areas in a way that conserves biological values. An important aspect of this approach was an analysis of the conservation value of habitats on the property, which used conservation principles and a GIS mapping methodology. An additional component of the conservation strategy was the consideration of the larger regional context in the conservation design of biological resources on the site. The Ranch, which extends from the ridgeline of the Santa Susana Mountains across the Santa Clara River to the uplands on the north, offers the potential for significant habitat contributions to a Santa Susana Mountains open area and a key segment of the Santa Clara River system, as well as regionally important connections between these habitat areas and across the River.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
The biological resource conservation strategy developed for the Newhall Ranch property addresses the sequencing recommended by the resource agencies: avoidance, minimization, and mitigation for unavoidable impacts to key sensitive resources. The proposed large, open areas on the Newhall Ranch property avoid impacts to many of the highly sensitive species present or potentially occurring on the site, and their habitats. Further design with respect to potential unavoidable impacts to biological resources has minimized encroachments into key areas of the property, decreasing the overall impacts. Indirect impacts to biological resources are minimized through the dedication of large blocks of habitat that decreases the edge-area ratio, and thus, buffers the habitat from noise, lighting, and encroachment by domestic pets, non-native plants, and humans. The result of these design efforts has produced a biological resource conservation strategy that has focused conservation and mitigation efforts on the Newhall Ranch property into two Special Management Areas and their connection: • the Santa Clara River Corridor (River Corridor SMA); • the large block of relatively undisturbed habitats on higher elevations into the Santa Susana Mountains (High Country SMA); and • the connection between these two areas along the Salt Creek drainage.			
In this design, the Conceptual Grading Plan (Draft EIR, Figure 1.0-14) has been developed to allow for preservation of significantly large areas of sensitive native habitats associated with the natural drainage areas of the site, and major landforms have been maintained. Large contiguous blocks of valuable habitat have been avoided and provided with direct linkage. The Specific Plan has focused on putting the two key habitat resource areas into consolidated blocks (connected by the Salt Creek drainage), resulting in minimal boundaries with developed areas. The assembly of these three elements will facilitate their management as a single special management area system within the Specific Plan area, as well as allowing coordination and interface with other programs outside the boundary of Newhall Ranch. The transitions between development and the special management areas will be the focus of special design treatments to protect the integrity of the conserved areas. As indicated above, the "edges" of urban development areas have been minimized to reduce the indirect impact potential of the Specific Plan, and native and compatible species will be used for landscaping in these areas.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase

4.6 BIOTA (cont.)

The open area system for Newhall Ranch includes the most important habitat areas of the Santa Clara River (River Corridor SMA) and the areas which have been least impacted by agricultural, and oil and natural gas production activities (High Country SMA). It also includes the largest, least fragmented patches of each habitat type that remain on Newhall Ranch. In addition to consolidating the habitat on the Ranch into two major interconnected blocks, the open areas include the largest remaining individual blocks of each of the important habitat types. Substantial proportions of each of the habitat types and vegetation associations that occur on the Ranch will be conserved within the open area system. The incorporation of the River, the mountains, and connection provides for conservation of substantially the entire range of terrain and vegetation types on Newhall Ranch.

By connecting the open areas into two major blocks with a major linkage, the land use plan for the Ranch provides for a minimum edge-to-area ratio within the Specific Plan area. The least accessible portion of the property, in terms of topography and presence of roads, is the High Country SMA. In addition, there is limited existing access to the River and to the Salt Creek corridor area. The topography along the High Country and River provide the opportunity to focus management activities to effectively limit access to the habitat in these key resource areas. Additional management practices are intended to restrict future access as the Specific Plan is implemented.

A critical component of the open area system within the Newhall Ranch property and in the region is the connection between the High Country and the River Corridor along Salt Creek. The corridor will provide continuity between the habitats and the wildlife populations within the property, as well as forming a permanent regional linkage between the Santa Clara River and the Santa Susana Mountains. Salt Creek is the most appropriate location for such a wildlife corridor connection because of several distinguishing characteristics. These include provision of a direct link between the two major open areas; less disturbance than any of the other potential connections; it is bound through most of its length by open area on the north side and, therefore, will not be surrounded by development in the future; it is the only drainage that would provide more than a discontinuous, narrow connection; it includes both upland and riparian vegetation through most of the corridor; and it is topographically isolated from areas of development on Newhall Ranch. Currently, a portion of the wildlife corridor is situated in Ventura County. Future land use decisions will be required to define the corridor's final configuration in areas that occur outside the County of Los Angeles.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase

4.6 BIOTA (cont.)

RESOURCE MANAGEMENT PLAN MITIGATION

Approval of the Specific Plan and its associated RMP would involve an amendment to the Los Angeles County zoning ordinance such that the provisions of the Specific Plan and RMP are binding. Specific measures to mitigate impacts to biological resources are incorporated as part of the Resource Management Plan (RMP) that is part of the Newhall Ranch Specific Plan. These measures are identified below:

SANTA CLARA RIVER (RIVER CORRIDOR) SMA

MITIGATION REQUIREMENTS

Mitigation for impacts for the Specific Plan on riparian resources will include restoration of riparian habitat and may include enhancement activities as well. In addition, a mitigation bank may be established as discussed in this section. The general areas in which riparian mitigation activities may take place are shown on Exhibit 2.6-3, Candidate Riparian Restoration/Enhancement Areas, of the Specific Plan.

The mitigation of Specific Plan impacts through restoration of habitat and enhancement of existing habitat quality shall conform to the requirements set forth below:

MITIGATION THROUGH RESTORATION

Habitat restoration as referred to in the Specific Plan means the revegetation of native plant communities on sites that have had the habitat removed due to past activities, such as agricultural or oil and natural gas operations.

Riparian resources along the Santa Clara River that are impacted by the Newhall Ranch Specific Plan will require restoration of similar habitat and values. Avoidance of impacts to riparian resources shall be the primary goal during the design of the individual stages of the Specific Plan. Unavoidable impacts to riparian resources shall be minimized through Specific Plan design, and then mitigated by the implementation of a revegetation plan. The revegetation plan may be prepared as part of a California Department of Fish and Game 1603 Streambed Alteration Agreement or U.S. Army Corps of Engineers Section 404 Permit and shall include the following:

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-1. The restoration mitigation areas located within the River Corridor SMA shall be in areas that have been disturbed by previous uses or activities. Mitigation shall be conducted only on sites where soils, hydrology, and microclimate conditions are suitable for riparian habitat. First priority will be given to those restorable areas that occur adjacent to existing patches (areas) of native habitat that support sensitive species, particularly endangered or threatened species. The goal is to increase habitat patch size and connectivity with other existing habitat patches while restoring habitat values that will benefit sensitive species.	Applicant (Project Biologist)	Field Verification	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plans
4.6-2. A qualified biologist shall prepare or review revegetation plans. The biologist shall also monitor the restoration effort from its inception through the establishment phase.	Applicant (Project Biologist)	Revegetation Plan Comments and Documentation of Restoration Monitoring from Qualified Biologist Field Verification	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plans and Monitor During Restoration Effort
4.6-3. Revegetation Plans may be prepared as part of a California Department of Fish and Game 1603 Streambed Alteration Agreement and/or an U.S. Army Corps of Engineers Section 404 Permit, and shall include: • Input from both the Project proponent and resource agencies to assure that the Project objectives applicable to the River Corridor SMA and the criteria of this RMP are met. • The identification of restoration/mitigation sites to be used. This effort shall involve an analysis of the suitability of potential sites to support the desired habitat, including a description of the existing conditions at the site(s) and such base line data information deemed necessary by the permitting agency.	Applicant (Project Biologist)	Revegetation Plan Review	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plan
4.6-4. The revegetation effort shall involve an analysis of the site conditions such as soils and hydrology so that site preparation needs can be evaluated. The revegetation plan shall include the details and procedures required to prepare the restoration site for planting (i.e., grading, soil preparation, soil stockpiling, soil amendments, etc.), including the need for a supplemental irrigation system, if any.	Applicant (Project Biologist)	Revegetation Plan Review	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plan

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-5. Restoration of riparian habitats within the River Corridor SMA shall use plant species native to the Santa Clara River. Cuttings or seeds of native plants shall be gathered within the River Corridor SMA or purchased from nurseries with local supplies to provide good genetic stock for the replacement habitats. Plant species used in the restoration of riparian habitat shall be listed on the approved project plant palette (Specific Plan Table 2.6-1, Recommended Plant Species for Habitat Restoration in the River Corridor SMA) or as approved by the permitting State and Federal agencies.	Applicant (Project Biologist)	Revegetation Plan Review Field Verification	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plan and Monitor During Restoration Effort
4.6-6. The final revegetation plans shall include notes that outline the methods and procedures for the installation of the plant materials. Plant protection measures identified by the project biologist shall be incorporated into the planting design/layout.	Applicant (Project Biologist)	Revegetation Plan Review	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plan
4.6-7. The revegetation plan shall include guidelines for the maintenance of the mitigation site during the establishment phase of the plantings. The maintenance program shall contain guidelines for the control of non-native plant species, the maintenance of the irrigation system, and the replacement of plant species.	Applicant (Project Biologist)	Revegetation Plan Review	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plan
4.6-8. The revegetation plan shall provide for monitoring to evaluate the growth of the developing habitat. Specific performance goals for the restored habitat shall be defined by qualitative and quantitative characteristics of similar habitats on the River (e.g., density, cover, species composition, structural development). The monitoring effort shall include an evaluation of not only the plant material installed, but the use of the site by wildlife. The length of the monitoring period shall be determined by the permitting state and/or federal agency.	Applicant (Project Biologist)	Revegetation Plan Review	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plan

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-9. Monitoring reports for the mitigation site shall be reviewed by the permitting State and/or Federal agency.	Applicant (Project Biologist)	Review of Monitoring Reports	1. ACOE and CDFG 2. ACOE and CDFG 3. During Revegetation Activities
4.6-10. Contingency plans and appropriate remedial measures shall also be outlined in the revegetation plan.	Applicant (Project Biologist)	Revegetation Plan Review	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plan
MITIGATION THROUGH ENHANCEMENT			
4.6-11. Habitat enhancement as referred to in this document means the rehabilitation of areas of native habitat that have been moderately disturbed by past activities (e.g., grazing, roads, oil and natural gas operations, etc.) or have been invaded by non-native plant species such as giant cane (*Arundo donax*) and tamarisk (*Tamarix* sp.).	Applicant (Project Biologist)	Revegetation Plan Review	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plan
4.6-12. Removal of grazing is an important means of enhancement of habitat values. Without ongoing disturbance from cattle, many riparian areas will recover naturally. Grazing except as permitted as a long-term resource management activity will be removed from the River Corridor SMA pursuant to the Long-Term Management Plan set forth in Section 4.6 of the Specific Plan EIR.	Land Owner/SMA Manager	Mitigation Monitoring Reports	1. LACDRP 2. LACDRP 3. Mitigation Monitoring Reports under CUP Condition No. 8
4.6-13. To provide guidelines for the installation of supplemental plantings of native species within enhancement areas, a revegetation plan shall be prepared prior to implementation of mitigation (see guidelines for revegetation plans above). These supplemental plantings will be composed of plant species similar to those growing in the existing habitat patch (see Specific Plan Table 2.6-1).	Applicant (Project Biologist)	Revegetation Plan Review	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plan

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-14. Not all enhancement areas will necessarily require supplemental plantings of native species. Some areas may support conditions conducive for rapid "natural" re-establishment of native species. The revegetation plan may incorporate means of enhancement to areas of compacted soils, poor soil fertility, trash or flood debris, and roads as a way of enhancing riparian habitat values.	Applicant (Project Biologist)	Revegetation Plan Review	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plan
4.6-15. Removal of non-native species such as giant cane (*Arundo donax*), salt cedar or tamarisk (*Tamarix* sp.), tree tobacco (*Nicotiana glauca*), castor bean (*Ricans communis*), if included in a revegetation plan to mitigate impacts, shall be subject to the following standards: • First priority shall be given to those habitat patches that support or have a high potential for supporting sensitive species, particularly endangered or threatened species. • All non-native species removals shall be conducted according to a resource agency approved exotics removal program. • Removal of non-native species in patches of native habitat shall be conducted in such a way as to minimize impacts to the existing native riparian plant species.	Applicant (Project Biologist)	Revegetation Plan Review	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Revegetation Plan
MITIGATION BANKING			
4.6-16. Mitigation banking activities for riparian habitats will be subject to State and Federal regulations and permits. Mitigation banking for oak resources shall be conducted pursuant to the Oak Resources Replacement Program. Mitigation banking for elderberry scrub shall be subject to approval of plans by the County Forester.	Applicant (Project Biologist)	State and Federal Permits; Submittal of Permits	1. ACOE, CDFG 2. ACOE, CDFG, 3. Prior to Approval of Mitigation Banking Program
		Oak Resources; Review of Oak Tree Permit	1. LACDRP 2. LACDRP 3. Approval of Oak Tree Permit
		Elderberry Scrub; Review of Initial Study	1. LACDRP 2. LACDRP 3. Prior to Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
MANAGEMENT REQUIREMENTS			
RECREATION AND ACCESS			
The quality of the habitat values that are conserved in the River Corridor SMA will benefit from the control of access to riparian areas. Guidelines for the control of access to the River Corridor SMA include the following:			
4.6-17. Access to the River Corridor SMA for hiking and biking shall be limited to the River trail system (including the Regional River Trail and various Local Trails) as set forth in this Specific Plan. • The River trail system shall be designed to avoid impacts to existing native riparian habitat, especially habitat areas known to support sensitive species. Where impacts to riparian habitat are unavoidable, disturbance shall be minimized and mitigated as outlined above under **Mitigation Measures 4.6-1** through **4.6-8**.	Applicant (Design)	Review of Trails Plans, Tract Maps, and/or Site Plans (Design)	1. LA County Department of Parks and Recreation 2. LA County Department of Parks and Recreation 3. Prior to Approval of Trails Plans, Tract Maps, and/or Site Plans, as applicable.
• Access to the River Corridor SMA will be limited to day time use of the designated trail system. • Signs indicating that no pets of any kind will be allowed within the River Corridor SMA, with the exception that equestrian use is permitted on established trails, shall be posted along the River Corridor SMA. • No hunting, fishing, or motor or off-trail bike riding shall be permitted. • The trail system shall be designed and constructed to minimize impacts on native habitats.	SMA Manager (Access)	Field Verification (Access)	1. LACDRP 2. LACDRP 3. Upon Complaint
TRANSITION AREAS			
4.6-18. Where development lies adjacent to the boundary of the River Corridor SMA a transition area shall be designed to lessen the impact of the development on the conserved area. Transition areas may be comprised of Open Area, natural or revegetated manufactured slopes, other planted areas, bank areas, and trails. Exhibits 2.6-4, 2.6-5, and 2.6-6 indicate the relationship between the River Corridor SMA and the development (disturbed) areas of the Specific Plan. The SMAs and the Open Area as well as the undisturbed portions of the development areas are shown in green. As indicated on the exhibits, on the south side of the River the River Corridor SMA is separated from development by the River bluffs, except in one location. The Regional River Trail will serve as transition area on the north side of the River where development areas adjoin the River Corridor SMA (excluding Travel Village).	Applicant	Review of Trails Plans, Tract Maps, and/or Site Plans	1. LACDRP 2. LACDRP 3. Prior to Approval of Trails Plans, Tract Maps, and/or Site Plans, as applicable.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
TRANSITION AREAS			
4.6-19. The following are the standards for design of transition areas: • In all locations where there is no steep grade separation between the River Corridor and development, a trail shall be provided along this edge. • Native riparian plants shall be incorporated into the landscaping of the transition areas between the River Corridor SMA and adjacent development areas where feasible for their long-term survival. Plants used in these areas shall be those listed on the approved plant palette (Specific Plan Table 2.6-2 of the Resource Management Plan [Recommended Plants for Transition Areas Adjacent to the River Corridor SMA]). • Roads and bridges that cross the River Corridor SMA shall have adequate barriers at their perimeters to discourage access to the River Corridor SMA adjacent to the structures. • Where bank stabilization is required to protect development areas, it shall be composed of ungrouted rock, or buried bank stabilization as described in Section 2.5.2.a, except at bridge crossings and other locations where public health and safety requirements necessitate concrete or other bank protection. • A minimum 100 foot wide buffer adjacent to the Santa Clara River should be required between the top river-side of bank stabilization and development within the Land Use Designations Residential Low Medium, Residential Medium, Mixed-Use and Business Park unless, through Planning Director review in consultation with the staff biologist, it is determined that a lesser buffer would adequately protect the riparian resources within the River Corridor or that a 100 foot wide buffer is infeasible for physical infrastructure planning. The buffer area may be used for public infrastructure, such as: flood control access; sewer, water and utility easements; abutments; trails and parks, subject to findings of consistency with the Specific Plan and applicable County policies.	Applicant	Review of Trails Plans, Tract Maps, and/or Site Plans	1. LACDRP and LACDPW for Bank Stabilization 2. LACDRP and LACDPW for Bank Stabilization 3. Prior to Approval of Trails Plans, Tract Maps, and/or Site Plans, as applicable
4.6-20. The following guidelines shall be followed during any grading activities that take place within the River Corridor SMA: • Grading perimeters shall be clearly marked and inspected by the project biologist prior to grading occurring within or immediately adjacent to the River Corridor SMA. • The project biologist shall work with the grading contractor to avoid inadvertent impacts to riparian resources.	Applicant (Project Biologist)	Field Verification	1. LACDPW 2. LACDPW 3. Prior to and During Grading Activities

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
GRADING ACTIVITIES			
LONG-TERM MANAGEMENT PLAN			
4.6-21. Upon final approval of the Newhall Ranch Specific Plan, the Special Management Area designation for the River Corridor SMA shall become effective. The permitted uses and development standards for the SMA are governed by the Development Regulations, Chapter 3 of the Specific Plan.	Los Angeles County	None Required	1. Los Angeles County 2. Los Angeles County 3. Upon Effective Date of Zoning Ordinance
4.6-22. Upon completion of development of all land uses, utilities, roads, flood control improvements, bridges, trails, and other improvements necessary for implementation of the Specific Plan within the River Corridor in each subdivision allowing construction within or adjacent to the River Corridor, a permanent, non-revocable *conservation and public access easement* shall be offered to the County of Los Angeles pursuant to **Mitigation Measure 4.6-23** below over the portion of the River Corridor SMA within that subdivision.	Land Owner	Offer of Dedication of Easement	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Submittal of Monitoring Report(s) Under CUP Condition No. 8
4.6-23. The River Corridor SMA *Conservation and Public Access Easement* shall be offered to the County of Los Angeles prior to the transfer of the River Corridor SMA ownership, or portion thereof to the management entity described in **Mitigation Measure 4.6-26** below.	Land Owner	Offer of Dedication of Easement	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Transfer of River Corridor Ownership Under 4.6-26
4.6-24. The River Corridor SMA *Conservation and Public Access Easement* shall prohibit grazing, except as a long-term resource management activity, and agriculture within the River Corridor and shall restrict recreation use to the established trail system. Agricultural land uses and grazing for purposes other than long-term resource management activities within the River Corridor shall be extended in the event of the filing of any legal action against Los Angeles County challenging final approval of the Newhall Ranch Specific Plan and any related project approvals or certification of the Final EIR for Newhall Ranch. Agricultural land uses and grazing for purposes other than long-term resource management activities within the River Corridor shall be extended by the time period between the filing of any such legal action and the entry of a final judgment by a court with appropriate jurisdiction, after exhausting all rights of appeal, or execution of a final settlement agreement between all parties to the legal action, whichever occurs first.	Land Owner	Review of Easement Document	1. LACDRP 2. LACDRP 3. Prior to Acceptance of Easement by County

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-25. The River Corridor SMA conservation and public access easement shall be consistent in its provisions with any other conservation easements to State or Federal resource agencies which may have been granted as part of mitigation or mitigation banking activities.	Land Owner	Review of Conservation Easement /and Resource Permits	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Recordation of River Corridor SMA Conservation Easement
4.6-26. Prior to the recordation of the River Corridor SMA *Conservation and Public Access Easement* as specified in **Mitigation Measure 4.6-23** above, the land owner shall provide a plan to the County for the permanent ownership and management of the River Corridor SMA, including any necessary financing. This plan shall include the transfer of ownership of the River Corridor SMA to the Center for Natural Lands Management, or if the Center for Natural Lands Management is declared bankrupt or dissolved, ownership will transfer or revert to a *joint powers authority* consisting of Los Angeles County (4 members), the City of Santa Clarita (2 members), and the Santa Monica Mountains Conservancy (2 members).	Land Owner	Approval of Management Plan by County	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Recordation of River Corridor SMA *Conservation Easement*
HIGH COUNTRY SPECIAL MANAGEMENT AREA (SMA)			
4.6-26a Two types of habitat restoration may occur in the High Country SMA: 1) riparian revegetation activities principally in Salt Creek Canyon; and 2) oak tree replacement in, or adjacent to, existing oak woodlands and savannahs. • Mitigation requirements for riparian revegetation activities within the High Country SMA are the same as those for the River Corridor SMA and are set forth in **Mitigation Measures 4.6-1** through **4.6-11** and **4.6-13** through **4.6-16** above. • Mitigation requirements for oak tree replacement are set forth in **Mitigation Measure 4.6-48** below.	Land Owner (Project Biologist)	Field Verification	1. ACOE, CDFG (Riparian) 2. ACOE, CDFG (Riparian) 3. Approval of Revegetation Plans
MITIGATION REQUIREMENTS Mitigation activities which may occur in the High Country SMA, either for impacts associated with the construction of Estate lots, trails or access roads, or for impacts identified during the subdivision process in other portions of the Specific Plan Area, include restoration of habitat and enhancement to existing habitat (see discussion below). Mitigation banking may be established as provided below. In addition, Salt Creek Canyon is a high priority area for riparian mitigation.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
MITIGATION THROUGH RESTORATION			
Two types of habitat restoration may occur in the High Country SMA: 1) riparian revegetation activities principally in Salt Creek Canyon; and 2) oak resource replacement in, or adjacent to, existing oak woodlands and savannas.			
Mitigation requirements for riparian revegetation activities within the High Country SMA are the same as those for the River Corridor SMA and are set forth above.			
Mitigation requirements for oak resource replacement are set forth in Specific Plan Section 2.6, paragraph 3b of the Oak Tree Replacement Program of the Resource Management Program.			
ENHANCEMENT OF HABITAT			
4.6-27. Removal of grazing from the High Country SMA except for those grazing activities associated with long-term resource management programs, is a principal means of enhancing habitat values in the creeks, brushland and woodland areas of the SMA. The removal of grazing in the High Country SMA is discussed below under (b) 4. Long Term Management. All enhancement activities for riparian habitat within the High Country SMA shall be governed by the same provisions as set forth for enhancement in the River Corridor SMA. Specific Plan Table 2.6-3 of the Resource Management Plan provides a list of appropriate plant species for use in enhancement areas in the High Country SMA.	Land Owner/CNLM	Enhancement Plans and Field Verification	1. LACDRP 2. CNLM 3. During Enhancement Activities
MITIGATION BANKING			
4.6-28. Mitigation banking activities for riparian habitats will be subject to State and Federal regulations and permits. Mitigation banking for oak resources, shall be conducted pursuant to the Oak Resource Replacement Program. Mitigation banking for elderberry scrub shall be subject to approval of plans by the County Forester.	Applicant (Project Biologist)	State and Federal Permits; Submittal of Permits	1. ACOE, and CDFG 2. ACOE, CDFG 3. Prior to Approval of Mitigation Banking Program
		Oak Resources; Review of Oak Tree Permit	1. LACDRP 2. LACDRP 3. Approval of Oak Tree Permit
		Elderberry Scrub; Review of Initial Study	1. LACDRP 2. LACDRP 3. Prior to Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
MANAGEMENT REQUIREMENTS			
RECREATION AND ACCESS			
The recreation opportunities presented by the High Country SMA are a major benefit of the SMA. However, recreational needs must be balanced with the preservation of the habitat values, which are conserved in the SMA. Recreation and access will be governed by the following standards:			
4.6-29. Access to the High Country SMA will be limited to day time use of the designated trail system.	Manager of High Country SMA	Field Verification	1. JPA as described in 4.6-41 2. JPA 3. In Perpetuity
4.6-30. No pets of any kind will be allowed within the High Country SMA, with the exception that equestrian use is permitted on established trails.	Manager of High Country SMA	Field Verification	1. JPA 2. JPA 3. In Perpetuity
4.6-31. No hunting, fishing, or motor or trail bike riding shall be permitted.	Manager of High Country SMA	Field Verification	1. JPA 2. JPA 3. In Perpetuity
4.6-32. The trail system shall be designed and constructed to minimize impacts on native habitats.	Applicant (Project Biologist)	Review of Trails Plan	1. JPA 2. JPA 3. Prior to Approval of Trails Plan
TRANSITION/FUEL MODIFICATION AREAS			
Development areas are generally separated from the High Country SMA by steep slopes. Specific Plan Exhibit 2.6-7 of the Resource Management Program, Salt Creek Wildlife Corridor Land Use Perspective, illustrates that development adjacent to the Salt Creek Wildlife Corridor is significantly separated vertically from the corridor.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-33. Construction of buildings and other structures (such as patios, decks, etc.) shall only be permitted upon developed pads within Planning Areas OV-04, OV-10, PV-02, and PV-28 and shall not be permitted on southerly slopes facing the High Country SMA (Planning Area HC-01) or in the area between the original SEA 20 boundary and the High Country boundary. If disturbed by grading, all southerly facing slopes which adjoin the High Country SMA within those Planning Areas shall have the disturbed areas revegetated with compatible trees, shrubs and herbs from the list of plant species for south and west facing slopes as shown in Table 2.6-3, Recommended Plant Species For Use In Enhancement Areas In The High Country.	Applicant	Field Verification	1. LACDRP/LA County Forester 2. LACDRP/LA County Forester 3. Prior to the Issuance of Building Permits
Transition from the development edge to the natural area shall also be controlled by the standards of wildfire fuel modification zones as set forth in **Mitigation Measure 4.6-49**. Within fuel modification areas, trees and herbs from Table 2.6-3 of the Resource Management Plan should be planted toward the top of slopes; and trees at lesser densities and shrubs planted on lower slopes.	Project Landscape Architect	Receipt of Wildfire Fuel Modification Plan	1. Los Angeles County Forester 2. Los Angeles County Forester 3. Prior to Recordation of Subdivision Maps
GRADING ACTIVITIES			
4.6-34. Grading perimeters shall be clearly marked and inspected by the project biologist prior to impacts occurring within or adjacent to the High Country SMA.	Applicant (Project Biologist)	Field Verification	1. LACDPW 2. LACDPW 3. Prior To and During Grading
4.6-35. The project biologist shall work with the grading contractor to avoid inadvertent impacts to biological resources outside of the grading area.	Applicant (Project Biologist)	Field Verification	1. LACDPW 2. LACDPW 3. During Grading
LONG-TERM MANAGEMENT			
4.6-36. Upon final approval of the Newhall Ranch Specific Plan, the Special Management Area designation for the High Country SMA shall become effective. The permitted uses and development standards for the SMA are governed by the Development Regulations, Chapter 3.	Los Angeles County	None Required	1. Los Angeles County 2. Los Angeles County 3. Upon Effective Date of Zoning Ordinance

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-37. The High Country SMA shall be offered for dedication in three approximately equal phases of approximately 1,400 acres each proceeding from north to south, as follows: 1) The first offer of dedication will take place with the issuance of the 2,000th residential building permit of Newhall Ranch; 2) The second offer of dedication will take place with the issuance of the 6,000th residential building permit of Newhall Ranch; and 3) The remaining offer of dedication will be completed by the 11,000th residential building permit of Newhall Ranch. 4) The Specific Plan applicant shall provide a quarterly report to the Departments of Public Works and Regional Planning which indicates the number of residential building permits issued in the Specific Plan area by subdivision map number.	Land Owner	Offer of Dedication	1. LA County Department of Regional Planning 2. LA County Department of Building and Safety 3. Upon Issuance of Building Permits
4.6-38. Prior to dedication of the High Country SMA, a *conservation and public access easement* shall be offered to the County of Los Angeles and a conservation and management easement offered to the Center for Natural Lands Management. The High Country SMA *Conservation and Public Access Easement* shall be consistent in its provisions with any other *conservation easement*s to State or Federal resource agencies which may have been granted as part of mitigation or mitigation banking activities.	Land Owner	Review of Easement Document	1. LA County Department of Regional Planning 2. LA County Department of Building and Safety 3. Upon Issuance of Building Permits
4.6-39. The High Country SMA conservation and public access easement shall prohibit grazing within the High Country, except for those grazing activities associated with the long-term resource management programs, and shall restrict recreation to the established trail system.	Land Owner	Review of Easement Document	1. LACDRP 2. LACDRP 3. Prior to Acceptance of Easement by Los Angeles County
4.6-40. The High Country SMA conservation and public access easement shall be consistent in its provisions with any other conservation easements to State or Federal resource agencies which may have been granted as part of mitigation or mitigation banking activities.	Land Owner	Review of Conservation Easement and Resource Permits	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Recordation of High Country SMA Conservation Easement

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-41. The High Country SMA shall be offered for dedication in fee to a *joint powers authority* consisting of Los Angeles County (4 members), the City of Santa Clarita (2 members), and the Santa Monica Mountains Conservancy (2 members). The *joint powers authority* will have overall responsibility for recreation within and conservation of the High Country.	Land Owner	Offer of Dedication	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Issuance of Building Permits
4.6-42. An appropriate type of service or assessment district shall be formed under the authority of the Los Angeles County Board of Supervisors for the collection of up to $24 per single family detached dwelling unit per year and $15 per single family attached dwelling unit per year, excluding any units designated as Low and Very Low affordable housing units pursuant to Section 3.10, Affordable Housing Program of the Specific Plan. This revenue would be assessed to the homeowner beginning with the occupancy of each dwelling unit and distributed to the *joint powers authority* for the purposes of recreation, maintenance, construction, conservation and related activities within the *High Country Special Management Area*.	Land Owner	Approval of Assessment District Report by County	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Issuance of First Residential Occupancy Permit
OPEN AREA			
MITIGATION REQUIREMENTS			
4.6-43. Suitable portions of *Open Area* may be used for mitigation of riparian, *oak resources*, or elderberry scrub. Mitigation activities within *Open Area* shall be subject to the following requirements, as applicable. • River Corridor SMA Mitigation Requirements, including: **Mitigation Measures 4.6-1** through **4.6-11** and **4.6-13** through **4.6-16**; and • High Country SMA Mitigation Requirements, including: **Mitigation Measures 4.6-27**, **4.6-29** through **4.6-42**, and • Mitigation Banking **— Mitigation Measure 4.6-16**.	Manager of Open Area	Review of Mitigation Plans/Field Verification	1. ACOE; CDFG or Los Angeles County as applicable 2. ACOE; CDFG or Los Angeles County as applicable 3. During Mitigation
MANAGEMENT REQUIREMENTS			
4.6-44. Drainages with flows greater than 2,000 cfs will have soft bottoms. Bank protection will be of ungrouted rock, or buried bank stabilization as described in Section 2.5.2.a, except at bridge crossings and other areas where public health and safety considerations require concrete or other stabilization.	Applicant (Civil Engineer)	Review Drainage Plans	1. LACDPW FCD 2. LACDPW FCD 3. Prior to Approval of Final Drainage Plans

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
MANAGEMENT REQUIREMENTS			
4.6-45. The precise alignments and widths of major drainages will be established through the preparation of drainage studies to be approved by the County at the time of subdivision maps which permit construction.	Applicant (Civil Engineer)	Review Drainage Plans	1. LACDPW FCD 2. LACDPW FCD 3. Prior to Approval of Tract Maps
4.6-46. While Open Area is generally intended to remain in a natural state, some grading may take place, especially for parks, major drainages, trails, and roadways. Trails are also planned to be within Open Area.	Applicant (Civil Engineer)	Review of Tentative Map	1. LACDRP 2. LACDRP 3. Prior to Tentative Map Approval
4.6-47. At the time that final subdivision maps permitting construction are recorded, the *Open Area* within the map will be offered for dedication to the Center for Natural Lands Management. Community Parks within *Open Area* are intended to be public parks. Prior to the offer of dedication of *Open Area* to the Center for Natural Lands Management, all necessary *conservation and public access easements*, as well as easements for infrastructure shall be offered to the County.	Land Owner	Review of Final Map	1. LACDRP 2. LACDRP 3. Prior to Recordation of Final Subdivision Maps
MITIGATION BANKING			
4.6-47a Mitigation Banking will be permitted within the River Corridor SMA, the High Country SMA, and the *Open Area land use designations*, subject to the following requirements: • Mitigation banking activities for riparian habitats will be subject to State and Federal regulations, and shall be conducted pursuant to the mitigation requirements set forth in **Mitigation Measure 4.6-1** through **4.6-15** above. • Mitigation banking for oak resources shall be conducted pursuant to **4.6-48** below. • Mitigation banking for elderberry scrub shall be subject to approval of plans by the County Forester.	Applicant (Project Biologist)	State and Federal Permits; Submittal of Permits	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Approval of Mitigation Banking Program
		Oak Resources; Review of Oak Tree Permit	1. LACDRP 2. LACDRP 3. Approval of Oak Tree Permit
		Elderberry Scrub; Review of Initial Study	1. LACDRP 2. LACDRP 3. Prior to Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
OAK RESOURCES REPLACEMENT PROGRAM			
4.6-48. Standards for the restoration and enhancement of oak resources within the High Country SMA and the Open Area include the following (oak resources include oak trees of the sizes regulated under the County Oak Tree Ordinance, southern California black walnut trees, Mainland cherry trees, and Mainland cherry shrubs): • To mitigate the impacts to oak resources which may be removed as development occurs in the Specific Plan Area, replacement trees shall be planted in conformance with the oak tree ordinance in effect at that time. • Oak resource species obtained from the local gene pool shall be used in restoration or enhancement. • Prior to recordation of construction-level final subdivision maps, an oak resource replacement plan shall be prepared that provides the guidelines for the oak tree planting and/or replanting. The Plan shall be reviewed by the Los Angeles Department of Regional Planning and the County Forester and shall include the following: site selection and preparation, selection of proper species including sizes and planting densities, protection from herbivores, site maintenance, performance standards, remedial actions, and a monitoring program. • All plans and specifications shall follow County oak tree guidelines, as specified in the County Oak Tree Ordinance.	Applicant (Project Biologist)	Oak Tree Permit(s)	1. LA County Forester 2. LA County Forester 3. Prior to Final Subdivision Map Recordation

WILDFIRE FUEL MODIFICATION

The Specific Plan Area is within the extreme and moderate fire hazard zones as identified in the County of Los Angeles General Plan. The moderate fire hazard zone extends to those areas of Newhall Ranch where native brush can be found growing in its natural state. This is most common in the hillside areas. The extreme fire hazard zone includes high brush and woodlands, and all steep slopes regardless of vegetation (refer to Section 4.18, Fire Services and Hazards, for a detailed description of on-site fire zones).

Development of Newhall Ranch will reduce the amount of native flammable vegetation present within the Specific Plan Area. Fire fighting capabilities will be provided by two fire stations on the Specific Plan site (see Figure 1.0-3, Land Use Plan), other nearby stations, and a system of improved roads and an urban water system with fire flows as required by the County Fire Department. Existing and proposed off-site fire facilities will also serve the Specific Plan Area.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
Property damage and public safety risks associated with wildfire are greatest where homes and other structures will be located adjacent to large open areas dominated by native vegetation. This condition will occur primarily in the southern portion of the Specific Plan site and where portions of the development area in the northwest section of Riverwood Village abut large natural open areas.			
Access is currently provided to the Los Angeles County Fire Department for fire prevention control of the Specific Plan Area. Access will continue to be provided as the Specific Plan is implemented.			
Fuel modification mitigation includes:			
4.6-49. To minimize the potential exposure of the development areas, Open Area, and the SMAs to fire hazards, the Specific Plan is subject to the requirements of the Los Angeles County Fire Protection District (LACFPD), which provides fire protection for the area. At the time of final subdivision maps permitting construction in development areas that are adjacent to Open Area and the High Country SMA, a wildfire fuel modification plan shall be prepared in accordance with the fuel modification ordinance standards in effect at that time and shall be submitted for approval to the County Fire Department.	Applicant	Review of Wildfire Fuel Modification Plan	1. LA County Forester 2. LA County Forester 3. Prior to Recordation of Final Subdivision Maps
4.6-50. The wildfire fuel modification plan shall depict a fuel modification zone the size of which shall be consistent with the County fuel modification ordinance requirements. Within the zone, tree pruning, removal of dead plant material and weed and grass cutting shall take place as required by the fuel modification ordinance.	Applicant (Project Biologist)	Review of Wildfire Fuel Modification Plan	1. LA County Forester 2. LA County Forester 3. Prior to Recordation of Final Subdivision Maps
4.6-51. In order to enhance the habitat value of plant communities which require fuel modification, fire retardant plant species containing habitat value may be planted within the fuel modification zone. Typical plant species suitable for Fuel Modification Zones are indicated in Specific Plan Table 2. 6-5 of the Resource Management Plan. Fuel modification zones adjacent to SMAs and Open Areas containing habitat of high value such as oak woodland and savannas shall utilize a more restrictive plant list which shall be reviewed by the County Forester.	Applicant (Project Biologist)	Review of Wildfire Fuel Modification Plan	1. LA County Forester 2. LA County Forester 3. Prior to Recordation of Final Subdivision Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-52. The wildfire fuel modification plan shall include the following construction period requirements: (a) a fire watch during welding operations; (b) spark arresters on all equipment or vehicles operating in a high fire hazard area; (c) designated smoking and non-smoking areas; and (d) water availability pursuant to the County Fire Department requirements.	Applicant (Project Biologist)	Review of Wildfire Fuel Modification Plan	1. LA County Forester 2. LA County Forester 3. Prior to Recordation of Final Subdivision Maps
EIR MITIGATION MEASURES			
To further reduce impacts to biological resources that would result from Specific Plan implementation the following mitigation measures are proposed:			
4.6-53. If, at the time any subdivision map proposing construction is submitted, the County determines through an Initial Study, or otherwise, that there may be rare, threatened or endangered, plant or animal species on the property to be subdivided, then, in addition to the prior surveys conducted on the Specific Plan site to define the presence or absence of sensitive habitat and associated species, current, updated site-specific surveys for all such animal or plant species shall be conducted in accordance with the consultation requirements set forth in Mitigation Measure 4.6-59 within those areas of the Specific Plan where such animal or plant species occur or are likely to occur. The site-specific surveys shall include the unarmored three-spine stickleback, the arroyo toad, the Southwestern pond turtle, the California red-legged frog, the southwestern willow flycatcher, the least Bell's vireo, the San Fernando Valley spineflower and any other rare, sensitive, threatened, or endangered plant or animal species occurring, or likely to occur, on the property to be subdivided. All site-specific surveys shall be conducted during appropriate seasons by qualified botanists or qualified wildlife biologists in a manner that will locate any rare, sensitive, threatened, or endangered animal or plant species that may be present. To the extent there are applicable protocols published by either the United States Fish and Wildlife Service or the California Department of Fish and Game, all such protocols shall be followed in preparing the updated site-specific surveys.	Applicant (Project Biologist)	Review of Initial Study	1. LACDRP 2. LACDRP 3. Prior to Approval of Subdivision Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-53. (cont.) All site-specific survey work shall be documented in a separate report containing at least the following information: (a) project description, including a detailed map of the project location and study area; (b) a description of the biological setting, including references to the nomenclature used and updated vegetation mapping; (c) detailed description of survey methodologies; (d) dates of field surveys and total person-hours spent on the field surveys; (e) results of field surveys, including detailed maps and location data; (f) an assessment of potential impacts; (g) discussion of the significance of the rare, threatened or endangered animal or plant populations found in the project area, with consideration given to nearby populations and species distribution; (h) mitigation measures, including avoiding impacts altogether, minimizing or reducing impacts, rectifying or reducing impacts through habitat restoration, replacement or enhancement, or compensating for impacts by replacing or providing substitute resources or environments, consistent with CEQA (*Guidelines* §15370); (i) references cited and persons contacted; and (j) other pertinent information, which is designed to disclose impacts and mitigate for such impacts."			
4.6-54. Prior to development within or disturbance to occupied Unarmored threespine stickleback habitat, a formal consultation with the USFWS shall occur.	Applicant (Project Biologist)	Section 7 Consultation	1. USFWS 2. USFWS 3. Prior to Grading
4.6-55. Prior to development or disturbance within wetlands or other sensitive habitats, permits shall be obtained from pertinent Federal and State agencies and the Specific Plan shall conform with the specific provisions of said permits. Performance criteria shall include that described in **Mitigation Measures 4.6-1** through **4.6-16** and **4.6-42** through **4.6-47** for wetlands, and **Mitigation Measures 4.6-27**, **4.6-28**, and **4.6-42** through **4.6-48** for other sensitive habitats.	Applicant (Project Biologist)	Receipt of Appropriate Permit applications	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-56. All lighting along the perimeter of natural areas shall be downcast luminaries with light patterns directed away from natural areas.	Applicant	Building Permit Plot Plan Review	1. LACDRP 2. LACDRP 3. Prior to Issuance of Building Permits
4.6-57. Where bridge construction is proposed and water flow would be diverted, blocking nets and seines shall be used to control and remove fish from the area of activity. All fish captured during this operation would be stored in tubs and returned unharmed back to the River after construction activities were complete.	Applicant (Project Biologist)	Field Verification	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Construction
4.6-58. To limit impacts to water quality the Specific Plan shall conform with all provisions of required NPDES permits and water quality permits that would be required by the State of California Regional Water Quality Control Board.	Project Engineer	Approval of a SWMP	1. LACDPW 2. LACDPW 3. Prior to Issuance of Grading Permit(s)

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-59. Consultation shall occur with the County of Los Angeles ("County") and California Department of Fish and Game ("CDFG") at each of the following milestones: 1) Before Surveys. Prior to conducting sensitive plant or animal surveys at the Newhall Ranch subdivision map level, the applicant, or its designee, shall consult with the County and CDFG for purposes of establishing and/or confirming the appropriate survey methodology to be used. 2) After Surveys. After completion of sensitive plant or animal surveys at the subdivision map level, draft survey results shall be made available to the County and CDFG within sixty (60) calendar days after completion of the field survey work. 3) Subdivision Map Submittal. Within thirty (30) calendar days after the applicant, or its designee, submits its application to the County for processing of a subdivision map in the Mesas Village or Riverwood Village, a copy of the submittal shall be provided to CDFG. In addition, the applicant, or its designee, shall schedule a consultation meeting with the County and CDFG for purposes of obtaining comments and input on the proposed subdivision map submittal. The consultation meeting shall take place at least thirty (30) days prior to the submittal of the proposed subdivision map to the County. 4) Development/Disturbance and Further Mitigation. Prior to any development within, or disturbance to, habitat occupied by rare, threatened, or endangered plant or animal species, or to any portion of the Spineflower Mitigation Area Overlay, as defined below, all required permits shall be obtained from both USFWS and CDFG, as applicable. It is further anticipated that the federal and state permits will impose conditions and mitigation measures required by federal and state law that are beyond those identified in the Newhall Ranch Final EIR (March 1999), the Newhall Ranch DAA (April 2001) and the Newhall Ranch Revised DAA (2002). It is also anticipated that conditions and mitigation measures required by federal and state law for project-related impacts on endangered, rare or threatened species and their habitat will likely require changes and revisions to Specific Plan development footprints, roadway alignments, and the limits, patterns and techniques associated with project-specific grading at the subdivision map level.	Applicant (Project Biologist)	Section 2081 Permit	1. USFWS and CDFG 2. USFWS and CDFG 3. Prior to Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-60. If at the time subdivisions permitting construction are processed, the County determines through an Initial Study that there may be elderberry scrub vegetation on the property being subdivided, then a site specific survey shall be conducted to define the presence or absence of such habitat and any necessary mitigation measures shall be determined and applied.	Applicant (Project Biologist)	Review of Initial Study	1. LACDRP 2. LACDRP 3. Prior to Approval of Subdivision Maps
4.6-61. If at the time subdivisions permitting construction are processed, the County determines through and Initial Study that there may be mainland cherry trees and/or mainland cherry shrubs on the property being subdivided, then a site specific survey shall be conducted to define the presence or absence of such habitat and any necessary mitigation measures shall be determined and applied.	Applicant (Project Biologist)	Review of Initial Study	1. LACDRP 2. LACDRP 3. Prior to Approval of Subdivision Maps
4.6-62. When a map revision or Substantial Conformance determination on any subdivision map or Conditional Use Permit would result in changes to an approved oak tree permit, then the oak tree report for that oak tree permit must be amended for the area of change, and the addendum must be approved by the County Forester prior to issuance of grading permits for the area of the map or CUP being changed.	Applicant (Project Biologist)	Approval of Addendum to Oak Tree Report	1. LA County Forester 2. LA County Forester 3. Prior to Issuance of Grading Permits
4.6-63. Riparian resources that are impacted by buildout of the Newhall Ranch Specific Plan shall be restored with similar habitat at the rate of one acre replaced for each acre lost.	Applicant (Project Biologist)	ACOE 404 Permit	1. ACOE, CDFG 2. ACOE, CDFG 3. Prior to Grading
4.6-64. The operator of the golf course shall prepare a Golf Course Maintenance Plan which shall include procedures to control storm water quality and ground water quality as a result of golf course maintenance practices, including irrigation, fertilizer, pesticide and herbicide use. This Plan shall be prepared in coordination with the County biologist and approved by the County Planning Director prior to the issuance of a Certificate of Occupancy.	Applicant (Golf Course Operator)	Golf Course Maintenance Plan	1. LACDRP 2. LACDRP 3. Issuance of Golf Course Occupancy Permit

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
SPINEFLOWER SPECIAL STUDY MITIGATION OVERLAY			
4.6-65. In order to facilitate the conservation of the spineflower on the Newhall Ranch Specific Plan site, the applicant, or its designee, shall, concurrent with Specific Plan approval, agree to the identified special study areas shown below in **Figure 2.6-8, Spineflower Mitigation Area Overlay**. The applicant, or its designee, further acknowledges that, within and around the Spineflower Mitigation Area Overlay (**Figure 2.6-8**), changes will likely occur to Specific Plan development footprints, roadway alignments, and the limits, patterns and techniques associated with project-specific grading at the subdivision map level. The applicant, or its designee, shall design subdivision maps that are responsive to the characteristics of the spineflower and all other endangered plant species that may be found on the Specific Plan site.	Applicant	Review of Initial Study and subdivision	1. LACDRP 2. LACDRP and CDFG 3. Prior to Approval of Subdivision Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
SPINEFLOWER PRESERVES			
4.6-66. Direct impacts to known spineflower populations within the Newhall Ranch Specific Plan area shall be avoided or minimized through the establishment of one or more on-site preserves that are configured to ensure the continued existence of the species in perpetuity. Preserve(s) shall be delineated in consultation with the County and CDFG, and will likely require changes and revisions to Specific Plan development footprints for lands within and around the Spineflower Mitigation Area Overlay (**Figure 2.6-8**). Delineation of the boundaries of Newhall Ranch spineflower preserve(s) for the entire Specific Plan area shall be completed in conjunction with approval of the first Newhall Ranch subdivision map filed in either the Mesas Village, or that portion of Riverwood Village in which the San Martinez spineflower population occurs. A sufficient number of known spineflower populations shall be included within the Newhall Ranch spineflower preserve(s) in order to ensure the continued existence of the species in perpetuity. The conservation of known spineflower populations shall be established in consultation with the County and CDFG, and as consistent with standards governing issuance of an incidental take permit for spineflower pursuant to Fish and Game Code section 2081, subdivision (b). In addition to conservation of known populations, spineflower shall be introduced in appropriate habitat and soils in the Newhall Ranch preserve(s). The creation of introduced populations shall require seed collection and/or top soil at impacted spineflower locations and nursery propagation to increase seed and sowing of seed. The seed collection activities, and the maintenance of the bulk seed repository, shall be approved in advance by the County and CDFG.	Applicant	Review of Initial Study and subdivision	1. LACDRP 2. LACDRP and CDFG 3. To be completed in conjunction with approval of the first Newhall Ranch subdivision map filed in either the Mesas Village, or that portion of Riverwood Village in which the San Martinez spineflower population occurs.

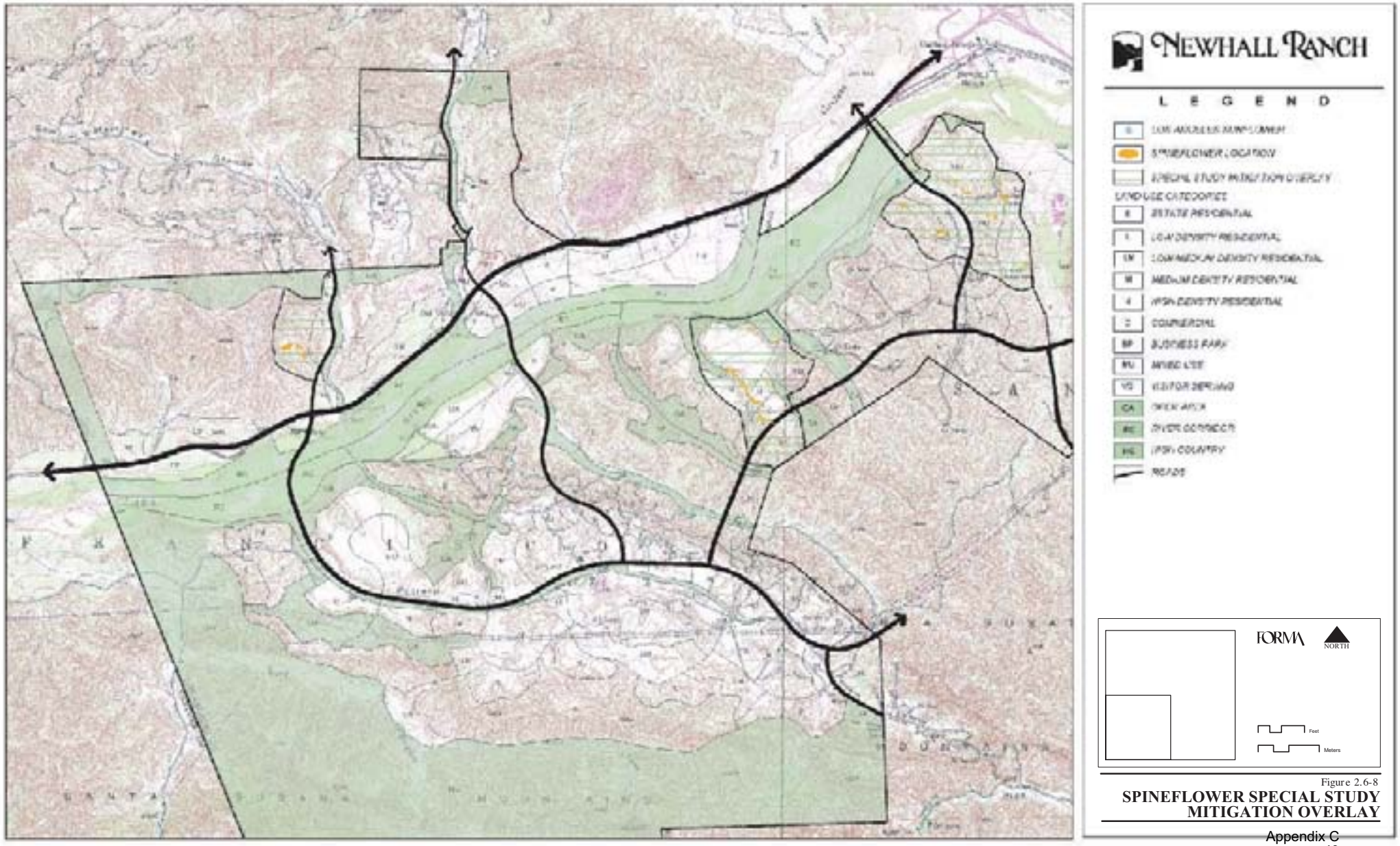

Figure 2.6-8
SPINEFLOWER SPECIAL STUDY MITIGATION OVERLAY

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-66. (cont.) Once the boundaries of the Newhall Ranch spineflower preserve(s) are delineated, the project applicant, or its designee, shall be responsible for conducting a spineflower population census within the Newhall Ranch spineflower preserve(s) annually for 10 years. (These census surveys shall be in addition to the surveys required by **Mitigation Measure 4.6-53**, above.) The yearly spineflower population census documentation shall be submitted to the County and CDFG, and maintained by the project applicant, or its designee. If there are any persistent population declines documented in the annual population census reports, the project applicant, or its designee, shall be responsible for conducting an assessment of the ecological factor(s) that are likely responsible for the decline, and implement management activity or activities to address these factors where feasible. In no event, however, shall project-related activities jeopardize the continued existence of the Newhall Ranch spineflower populations. If a persistent population decline is documented, such as a trend in steady population decline that persists for a period of 5 consecutive years, or a substantial drop in population is detected over a 10-year period, spineflower may be introduced in consultation with CDFG in appropriate habitat and soils in the Newhall Ranch preserve(s), utilizing the bulk spineflower seed repository, together with other required management activity or activities. These activities shall be undertaken by a qualified botanist/biologist, subject to approval by the County and CDFG. The project applicant, or its designee, shall be responsible for the funding and implementation of the necessary management activity or activities, including monitoring, as approved by the County and CDFG. Annual viability reports shall be submitted to the County and CDFG for 10 years following delineation of the Newhall Ranch spineflower preserve(s) to ensure long-term documentation of the spineflower population status within the Newhall Ranch preserve(s). In the event annual status reports indicate the spineflower population within the Newhall Ranch preserve(s) is not stable and viable 10 years following delineation of the spineflower preserve(s), the project applicant, or its designee, shall continue to submit annual status reports to the County and CDFG for a period of no less than an additional 5 years.	Applicant	Review of Initial Study and subdivision	1. LACDRP 2. LACDRP and CDFG 3. To be completed in conjunction with approval of the first Newhall Ranch subdivision map filed in either the Mesas Village, or that portion of Riverwood Village in which the San Martinez spineflower population occurs.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
CONNECTIVITY, RESERVE DESIGN AND BUFFERS			
4.6-67. Indirect impacts associated with the interface between the preserved spineflower populations and planned development within the Newhall Ranch Specific Plan shall be avoided or minimized by establishing open space connections with Open Area, River Corridor, or High Country land use designations. In addition, buffers (i.e., setbacks from developed, landscaped or other use areas) shall be established around portions of the delineated preserve(s) not connected to Open Area, the River Corridor or the High Country land use designations. The open space connections and buffer configurations shall take into account local hydrology, soils, existing and proposed adjacent land uses, the presence of non-native invasive plant species, and seed dispersal vectors. Open space connections shall be configured such that the spineflower preserves are connected to Open Area, River Corridor, or High Country land use designations to the extent practicable. Open space connections shall be of adequate size and configuration to achieve a moderate to high likelihood of effectiveness in avoiding or minimizing indirect impacts (e.g., invasive plants, increased fire frequency, trampling, chemicals, etc.) to the spineflower preserve(s). Open space connections for the spineflower preserve(s) shall be configured in consultation with the County and CDFG. Open space connections for the spineflower preserve(s) shall be established for the entire Specific Plan area in conjunction with approval of the first Newhall Ranch subdivision map filed in either the Mesa Village, or that portion of the Riverwood Village in which the San Martinez spineflower location occurs.	Applicant	Review of Initial Study and subdivision	1. LACDRP/CDFG 2. LACDRP/CDFG 3. Prior to Approval of Subdivision Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-67. (cont.) For preserves and/or those portions of preserves not connected to Open Area, River Corridor, or High Country land use designations, buffers shall be established at variable distances of between 80 and 200 feet from the edge of development to achieve a moderate to high likelihood of effectiveness in avoiding or minimizing indirect impacts (e.g., invasive plants, increased fire frequency, trampling, chemicals, etc.) to the spineflower preserve(s). The buffer size/configuration shall be guided by the analysis set forth in the "*Review of Potential Edge Effects on the San Fernando Valley Spineflower*," prepared by Conservation Biology Institute, January 19, 2000, and other sources of scientific information and analysis, which are available at the time the preserve(s) and buffers are established. Buffers for the spineflower preserve(s) shall be configured in consultation with the County and CDFG for the entire Specific Plan area. Buffers for the spineflower preserve(s) shall be established in conjunction with approval of the first Newhall Ranch subdivision map filed in either the Mesa Village, or that portion of the Riverwood Village in which the San Martinez spineflower location occurs. Roadways and road rights-of-way shall not be constructed in any spineflower preserve(s) and buffer locations on Newhall Ranch unless constructing the road(s) in such location is found to be the environmentally superior alternative in subsequently required tiered EIRs in connection with the Newhall Ranch subdivision map(s) process. No other development or disturbance of native habitat shall be allowed within the spineflower preserve(s) or buffer(s). The project applicant, or its designee, shall be responsible for revegetating open space connections and buffer areas of the Newhall Ranch spineflower preserve(s) to mitigate temporary impacts due to grading that will occur within portions of those open space connections and buffer areas. The impacted areas shall be reseeded with a native seed mix to prevent erosion, reduce the potential for invasive non-native plants, and maintain functioning habitat areas within the buffer area. Revegetation seed mix shall be reviewed and approved by the County and CDFG.	Applicant	Review of Initial Study and subdivision	1. LACDRP/CDFG 2. LACDRP/CDFG 3. Prior to Approval of Subdivision Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
PRESERVE PROTECTION/FENCING			
4.6-68. To protect the preserved Newhall Ranch spineflower populations, and to further reduce potential direct impacts to such populations due to unrestricted access, the project applicant, or its designee, shall erect and maintain temporary orange fencing and prohibitive signage around the Newhall Ranch preserve(s), open space connections and buffer areas, which are adjacent to areas impacted by proposed development prior to and during all phases of construction. The areas behind the temporary fencing shall not be used for the storage of any equipment, materials, construction debris or anything associated with construction activities. Following the final phase of construction of any Newhall Ranch subdivision map adjacent to the Newhall Ranch spineflower preserve(s), the project applicant, or its designee, shall install and maintain permanent fencing along the subdivision tract bordering the preserve(s). Permanent signage shall be installed on the fencing along the preservation boundary to indicate that the fenced area is a biological preserve, which contains protected species and habitat, that access is restricted, and that trespassing and fuel modification are prohibited within the area. The permanent fencing shall be designed to allow wildlife movement. The plans and specifications for the permanent fencing and signage shall be approved by the County and CDFG prior to the final phase of construction of any Newhall Ranch subdivision map adjacent to a Newhall Ranch spineflower preserve(s).	Applicant (Project Biologist)	Review of Initial Study, subdivision, and grading permit application	1. LACDRP/CDFG 2. LACDRP/CDFG 3. Prior to Grading and Occupancy

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
PRESERVE PROTECTION/HYDROLOGICAL ALTERATIONS			
4.6-69. Indirect impacts resulting from changes to hydrology (i.e., increased water runoff from surrounding development) at the interface between spineflower preserve(s) and planned development within the Newhall Ranch Specific Plan shall be avoided or mitigated to below a level of significance. Achievement of this standard will be met through the documented demonstration by the project applicant, or its designee, that the storm drain system achieves pre-development hydrological conditions for the Newhall Ranch spineflower preserve(s). To document such a condition, the project applicant, or its designee, shall prepare a study of the pre- and post-development hydrology, in conjunction with Newhall Ranch subdivision maps adjacent to spineflower preserve(s). The study shall be used in the design and engineering of a storm drain system that achieves pre-development hydrological conditions. The study must conclude that proposed grade changes in development areas beyond the buffers will maintain pre-development hydrology conditions within the preserve(s). The study shall be approved by the Planning Director of the County, and the resulting conditions confirmed by CDFG. The storm drain system for Newhall Ranch subdivision maps adjacent to any spineflower preserves must be approved by the County prior to the initiation of any grading activities.	Applicant (Project Biologist)	Review of map subdivision	1. LACDPW 2. LACDPW/CDFG 3. Prior to Approval of Subdivision Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
ROAD CONSTRUCTION MEASURES			
4.6-70. Consistent with the Spineflower Mitigation Area Overlay reflected in **Mitigation Measure 4.6-65**, direct impacts to known Newhall Ranch spineflower populations associated with proposed road construction or modifications to existing roadways shall be further assessed for proposed road construction at the Newhall Ranch subdivision map level, in conjunction with the tiered EIR required for each subdivision map. To avoid or substantially lessen direct impacts to known spineflower populations, Specific Plan roadways shall be redesigned or realigned, to the extent practicable, to achieve the spineflower preserve and connectivity/preserve design/buffer standards set forth in **Mitigation Measures 4.6-66 and 4.6-67**. The project applicant, or its designee, acknowledges that that road redesign and re-alignment is a feasible means to avoid or substantially lessen potentially significant impacts on the now known Newhall Ranch spineflower populations. Road redesign or alignments to be considered at the subdivision map level include: (a) Commerce Center Drive; (b) Magic Mountain Parkway; (c) Chiquito Canyon Road; (d) Long Canyon Road; (e) San Martinez Grande Road; (f) Potrero Valley Road; (g) Valencia Boulevard; and (h) Any other or additional roadways that have the potential to significantly impact known Newhall Ranch spineflower populations. Roadways and road rights-of-way shall not be constructed in any spineflower preserve(s) and buffer locations on Newhall Ranch, unless constructing the road(s) in such location is found to be the environmentally superior alternative in subsequently required tiered EIRs in connection with the Newhall Ranch subdivision map(s) process.	Applicant (Project Biologist)	Review of Initial Study and subdivision	1. LACDRP 2. LACDRP/CDFG 3. Prior to Approval of Subdivision Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
ENGINEERING, DESIGN AND GRADING MODIFICATIONS			
4.6-71. Consistent with the Spineflower Mitigation Area Overlay reflected in **Mitigation Measure 4.6-65**, direct impacts to known Newhall Ranch spineflower populations shall be further assessed at the Newhall Ranch subdivision map level, in conjunction with the required tiered EIR process. To avoid or substantially lessen impacts to known spineflower populations at the subdivision map level, the project applicant, or its designee, may be required to adjust Specific Plan development footprints, roadway alignments, and the limits, patterns and techniques associated with project-specific grading to achieve the spineflower preserve and connectivity/preserve design/buffer standards set forth in **Mitigation Measures 4.6-66 and 4.6-67** for all future Newhall Ranch subdivision maps that encompass identified spineflower populations.	Applicant (Project Biologist)	Review of Initial Study and subdivision	1. LACDRP 2. LACDRP/CDFG 3. Prior to Approval of Subdivision Maps
4.6 BIOTA (cont.)			
FIRE MANAGEMENT PLAN			
4.6-72. A Fire Management Plan shall be developed to avoid and minimize direct and indirect impacts to the spineflower, in accordance with the adopted Newhall Ranch Resource Management Plan (RMP), to protect and manage the Newhall Ranch spineflower preserve(s) and buffers. The Fire Management Plan shall be completed by the project applicant, or its designee, in conjunction with approval of any Newhall Ranch subdivision map adjacent to a spineflower preserve. The final Fire Management Plan shall be approved by the County of Los Angeles Fire Department through the processing of subdivision maps. Under the final Fire Management Plan, limited fuel modification activities within the spineflower preserves will be restricted to selective thinning with hand tools to allow the maximum preservation of Newhall Ranch spineflower populations. No other fuel modification or clearance activities shall be allowed in the Newhall Ranch spineflower preserve(s). Controlled burning may be allowed in the future within the Newhall Ranch preserve(s) and buffers, provided that it is based upon a burn plan approved by the County of Los Angeles Fire Department and CDFG. The project applicant, or its designee, shall also be responsible for annual maintenance of fuel modification zones, including, but not limited to, removal of undesirable non-native plants, revegetation with acceptable locally indigenous plants and clearing of trash and other debris in accordance with the County of Los Angeles Fire Department.	Applicant (Project Biologist)	Review of Initial Study and subdivision	1. LACFD 2. LACFD/CDFG 3. Prior to Approval of Subdivision Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
WATER FLOW DIVERSION AND MANAGEMENT			
4.6-73. At the subdivision map level, the project applicant, or its designee, shall design and implement project-specific design measures to minimize changes in surface water flows to the Newhall Ranch spineflower preserve(s) for all Newhall Ranch subdivision maps adjacent to the preserve(s) and buffers, and avoid and minimize indirect impacts to the spineflower. Prior to issuance of a grading permit for each such subdivision map, the project applicant, or its designee, shall submit for approval to the County plans and specifications that ensure implementation of the following design measures: (a) During construction activities, drainage ditches, piping or other approaches will be put in place to convey excess storm water and other surface water flows away from the Newhall Ranch spineflower preserve(s) and connectivity/preserve design/buffers, identified in **Mitigation Measures 4.6-66** and **4.6-67**; (b) Final grading and drainage design will be developed that does not change the current surface and subsurface hydrological conditions within the preserve(s); (c) French drains will be installed along the edge of any roadways and fill slopes that drain toward the preserve(s); (d) Roadways will be constructed with slopes that convey water flows within the roadway easements and away from the preserve(s); (e) Where manufactured slopes drain toward the preserve(s), a temporary irrigation system would be installed to the satisfaction of the County in order to establish the vegetation on the slope area(s). This system shall continue only until the slope vegetation is established and self-sustaining; (f) Underground utilities will not be located within or through the preserve(s). Drainage pipes installed within the preserve(s) away from spineflower populations to convey surface or subsurface water away from the populations will be aligned to avoid the preserve(s) to the maximum extent practicable; and (g) Fencing or other structural type barriers that will be installed to reduce intrusion of people or domestic animals into the preserve(s) shall incorporate footing designs that minimize moisture collection.	Applicant (Project Biologist)	Review of Initial Study and subdivision	1. LACDRP/LACDPW 2. LACDRP/LACDPW/CDFG 3. Prior to Approval of Subdivision Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
BIOLOGICAL MONITOR			
4.6-74. A knowledgeable, experienced botanist/biologist, subject to approval by the County and CDFG, shall be required to monitor the grading and fence/utility installation activities that involve earth movement adjacent to the Newhall Ranch spineflower preserve(s) to avoid the incidental take through direct impacts of conserved plant species, and to avoid disturbance of the preserve(s). The biological monitor will conduct bi-weekly inspections of the project site during such grading activities to ensure that the mitigation measures provided in the adopted Newhall Ranch Mitigation Monitoring Program (Biota section) are implemented and adhered to. Monthly monitoring reports, as needed, shall be submitted to the County verifying compliance with the mitigation measures specified in the adopted Newhall Ranch Mitigation Monitoring Program (Biota section). The biological monitor will have authority to immediately stop any such grading activity that is not in compliance with the adopted Newhall Ranch Mitigation Monitoring Program (Biota section), and to take reasonable steps to avoid the take of, and minimize the disturbance to, spineflower populations within the preserve(s).	Monitoring Biologist	Bi-weekly site inspections and monthly monitoring reports as needed	1. LACDRP/LACDPW 2. LACDRP/LACDPW/CDFG 3. Prior to Issuance of construction permit(s)

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
CONSTRUCTION IMPACT AVOIDANCE MEASURES			
4.6-75. The following measures shall be implemented to avoid and minimize indirect impacts to Newhall Ranch spineflower populations during all phases of project construction: (a) Water Control. Watering of the grading areas would be controlled to prevent discharge of construction water into the Newhall Ranch preserve(s) or on ground sloping toward the preserve(s). Prior to the initiation of grading operations, the project applicant, or its designee, shall submit for approval to the County an irrigation plan describing watering control procedures necessary to prevent discharge of construction water into the Newhall Ranch preserve(s) and on ground sloping toward the preserve(s). (b) Storm Water Flow Redirection. Diversion ditches would be constructed to redirect storm water flows from graded areas away from the Newhall Ranch preserve(s). To the extent practicable, grading of areas adjacent to the preserve(s) would be limited to spring and summer months (May through September) when the probability of rainfall is lower. Prior to the initiation of grading operations, the project applicant, or its designee, would submit for approval to the County a storm water flow redirection plan that demonstrates the flow of storm water away from the Newhall Ranch spineflower preserve(s). (c) Treatment of Exposed Graded Slopes. Graded slope areas would be trimmed and finished as grading proceeds. Slopes would be treated with soil stabilization measures to minimize erosion. Such measures may include seeding and planting, mulching, use of geotextiles and use of stabilization mats. Prior to the initiation of grading operations, the project applicant, or its designee, would submit for approval to the County the treatments to be applied to exposed graded slopes that would ensure minimization of erosion.	Monitoring Biologist	Bi-weekly site inspections and monthly monitoring reports as needed	1. LACDRP/LACDPW 2. LACDRP/LACDPW/CDFG 3. Prior to issuance of occupancy permit(s)

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
REASSESSMENT REQUIREMENT			
4.6-76. In conjunction with submission of the first Newhall Ranch subdivision map in either Mesas Village or that portion of Riverwood Village in which the San Martinez spineflower location occurs, the project applicant, or its designee, shall reassess project impacts, both direct and indirect, to the spineflower populations using subdivision mapping data, baseline data from the Newhall Ranch Final EIR and data from the updated plant surveys (see, Specific Plan EIR Mitigation Measure 4.6-53). This reassessment shall take place during preparation of the required tiered EIR for each subdivision map. If the reassessment results in the identification of new or additional impacts to Newhall Ranch spineflower populations, which were not previously known or identified, the mitigation measures set forth in this program, or a Fish and Game Code section 2081 permit(s) issued by CDFG, shall be required, along with any additional mitigation required at that time.	Applicant (Project Biologist)	In conjunction with submission of the first subdivision map in either Mesas Village or that portion of Riverwood Village in which the San Martinez spineflower location occurs	1. LACDRP 2. LACDRP/CDFG 3. Prior to subdivision map approval

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
NEWHALL RANCH MONITORING AND MANAGEMENT			
4.6-77. Direct and indirect impacts to the preserved Newhall Ranch spineflower populations shall require a monitoring and management plan, subject to the approval of the County. The applicant shall consult with CDFG with respect to preparation of the Newhall Ranch spineflower monitoring/management plan. This plan shall be in place when the preserve(s) and connectivity/preserve design/buffers are established (see **Mitigation Measures 4.6-66 and 4.6-67**). The criteria set forth below shall be included in the plan. **Monitoring**. The purpose of the monitoring component of the plan is to track the viability of the Newhall Ranch spineflower preserve(s) and its populations, and to ensure compliance with the adopted Newhall Ranch Mitigation Monitoring Program (Biota section). The monitoring component of the plan shall investigate and monitor factors such as population size, growth or decline, general condition, new impacts, changes in associated vegetation species, pollinators, seed dispersal vectors and seasonal responses. Necessary management measures will be identified. The report results will be sent annually to the County, along with photo documentation of the assessed site conditions. The project applicant, or its designee, shall contract with a qualified botanist/biologist, approved by the County, with the concurrence of CDFG, to conduct quantitative monitoring over the life of the Newhall Ranch Specific Plan. The botanist/biologist shall have a minimum of three years experience with established monitoring techniques and familiarity with southern California flora and target taxa. Field surveys of the Newhall Ranch spineflower preserve(s) will be conducted each spring. Information to be obtained will include: (a) an estimate of the numbers of spineflowers in each population within the preserve(s); (b) a map of the extent of occupied habitat at each population; (c) establishment of photo monitoring points to aid in documenting long-term trends in habitat; (d) aerial photographs of the preserved areas at five-year intervals; (e) identification of significant impacts that may have occurred or problems that need attention, including invasive plant problems, weed problems and fencing or signage repair; and (f) overall compliance with the adopted mitigation measures.	Applicant (Project Biologist)	Site surveys and annual reports as directed by this measure The length of the active management components set forth above shall be governed by attainment of successful management criteria	1. LACDRP 2. LACDRP/CDFG 3. As necessary per the guidelines set forth in the measure

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-77. (cont.) For a period of three years from Specific Plan re-approval, all areas of potential habitat on the Newhall Ranch site will be surveyed annually in the spring with the goal of identifying previously unrecorded spineflower populations. Because population size and distribution limits are known to vary depending on rainfall, annual surveys shall be conducted for those areas proposed for development in order to establish a database appropriate for analysis at the project-specific subdivision map level (rather than waiting to survey immediately prior to proceeding with the project-specific subdivision map process). In this way, survey results gathered over time (across years of varying rainfall) will provide information on ranges in population size and occupation. New populations, if they are found, will be mapped and assessed for inclusion in the preserve program to avoid impacts to the species. **Monitoring/Reporting.** An annual report will be submitted to the County and CDFG by December 31st of each year. The report will include a description of the monitoring methods, an analysis of the findings, effectiveness of the mitigation program, site photographs and adoptive management measures, based on the findings. Any significant adverse impacts, signage, fencing or compliance problems identified during monitoring visits will be reported to the County and CDFG for corrective action by the project applicant, or its designee. **Management**. Based on the outcome of ongoing monitoring and additional project-specific surveys addressing the status and habitat requirements of the spineflower, active management of the Newhall Ranch spineflower preserve(s) will be required in perpetuity. Active management activities will be triggered by a downward population decline over 5 consecutive years, or a substantial drop in population over a 10-year period following County re-approval of the Specific Plan. Examples of management issues that may need to be addressed in the future include, but are not limited to, control of exotic competitive non-native plant species, herbivory predation, weed control, periodic controlled burns or fuel modification compliance.	Applicant (Project Biologist)	Site surveys and annual reports as directed by this measure The length of the active management components set forth above shall be governed by attainment of successful management criteria	1. LACDRP 2. LACDRP/CDFG 3. As necessary per the guidelines set forth in the measure

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-77. (cont.) After any population decline documented in the annual populations census following County re-approval of the Specific Plan, the project applicant, or its designee, shall be responsible for conducting an assessment of the ecological factor(s) that are likely responsible for the decline, and implement management activity or activities to address these factors where feasible. If a persistent population decline is documented, such as a trend in steady population decline persistent for a period of 5 consecutive years, or a substantial drop in population detected over a 10-year period, spineflower may be introduced in appropriate habitat and soils in the Newhall Ranch preserve(s), utilizing the bulk spineflower seed repository, together with other required management activity or activities. In connection with this monitoring component, the project applicant, or its designee, shall contract with a qualified botanist/biologist, approved by the County, to complete: (a) a study of the breeding and pollination biology of the spineflower, including investigation into seed physiology to assess parameters that may be important as management tools to guarantee self-sustainability of populations, which may otherwise have limited opportunity for germination; and (b) a population genetics study to document the genetic diversity of the Newhall Ranch spineflower population. The criteria for these studies shall be to develop data to make the Newhall Ranch spineflower management program as effective as possible. These studies shall be subject to approval by the County's biologist, with the concurrence of CDFG. These activities shall be undertaken by a qualified botanist/biologist, subject to approval by the County with the concurrence of CDFG. The project applicant, or its designee, shall be responsible for the funding and implementation of the necessary management activity or activities, as approved by the County and CDFG. The length of the active management components set forth above shall be governed by attainment of successful management criteria set forth in the plan rather than by a set number of years.	Applicant (Project Biologist)	Site surveys and annual reports as directed by this measure The length of the active management components set forth above shall be governed by attainment of successful management criteria	1. LACDRP 2. LACDRP/CDFG 3. As necessary per the guidelines set forth in the measure

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
TRANSLOCATION/REINTRODUCTION PROGRAM			
4.6-78. To the extent project-related direct and indirect significant impacts on spineflower cannot be avoided or substantially lessened through establishment of the Newhall Ranch spineflower preserve(s), and other avoidance, minimization, or other compensatory mitigation measures, a translocation and reintroduction program may be implemented in consultation with CDFG to further mitigate such impacts. Direct impacts (i.e., take) to occupied spineflower areas shall be fully mitigated at a 4:1 ratio. Impacts to occupied spineflower areas caused by significant indirect effects shall be mitigated at a 1:1 ratio. Introduction of new spineflower areas will be achieved through a combination of direct seeding and translocation of the existing soil seed bank that would be impacted by grading. Prior to any development within, or disturbance to, spineflower populations, on-site and off-site mitigation areas shall be identified and seed and top soil shall be collected. One-third of the collected seed shall be sent to the Rancho Santa Ana Botanical Garden for storage. One third of the seed shall be sent to the USDA National Seed Storage Lab in Fort Collins, Colorado for storage. One third shall be used for direct seeding of the on-site and off-site mitigation areas. **Direct seeding**. Prior to the initiation of grading, the project applicant, or its designee, shall submit to the County a program for the reintroduction of spineflower on Newhall Ranch. The reintroduction program shall include, among other information: (a) location map with scale; (b) size of each introduction polygon; (c) plans and specifications for site preparation, including selective clearing of competing vegetation; (d) site characteristics; (e) protocol for seed collection and application; and (f) monitoring and reporting. The program shall be submitted to CDFG for input and coordination. The project applicant, or its designee, shall implement the reintroduction program prior to the initiation of grading. At least **two** candidate spineflower reintroduction areas will be created within Newhall Ranch and one candidate spineflower reintroduction area will be identified offsite. Both on-site and off-site reintroduction areas will be suitable for the spineflower in both plant community and soils, and be located within the historic range of the taxon. Success criteria shall be included in the monitoring/management plan, with criteria for the germination, growth, and production of viable seeds of individual plants for a specified period.	Applicant (Project Biologist)	Review of Initial Study and subdivision	1. LACDRP/CDFG 2. LACDRP/CDFG 3. Prior to issuance of occupancy permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
4.6-78. (cont.) Although the reintroduction program is experimental at this stage, the County considers such a program to be a feasible form of mitigation at this juncture based upon available studies. Botanists/biologists familiar with the ecology and biology of the spineflower would prepare and oversee the reintroduction program. **Translocation**. Prior to the initiation of grading, the project applicant, or its designee, shall submit to the County a translocation program for the spineflower. Translocation would salvage the topsoil of spineflower areas to be impacted due to grading. Salvaged spineflower soil seed bank would be translocated to the candidate spineflower reintroduction areas. The translocation program shall include, among other information: (a) location map with scale; (b) size of each translocation polygon; (c) plans and specifications for site preparation, including selective clearing of competing vegetation; (d) site characteristics; (e) protocol for topsoil collection and application; and (f) monitoring and reporting. The translocation program shall be submitted to CDFG for input and coordination. Translocation shall occur within the candidate spineflower reintroduction areas onsite and offsite. Successful criteria for each site shall be included in the monitoring/management plan/with criteria for the germination and growth to reproduction of individual plants for the first year a specified period. Although the translocation program is experimental at this stage, the County considers such a program to be a feasible form of mitigation at this juncture based upon available studies. Botanists/biologists familiar with the ecology and biology of the spineflower would prepare and oversee the translocation program.	Applicant (Project Biologist)	Review of Initial Study and subdivision	1. LACDRP/CDFG 2. LACDRP/CDFG 3. Prior to issuance of occupancy permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.6 BIOTA (cont.)			
ON-GOING AGRICULTURAL ACTIVITIES			
4.6-79. The project applicant, or its designee, shall engage in regular and ongoing consultation with the County and CDFG in connection with its ongoing agricultural operations in order to avoid or minimize significant direct impacts to the spineflower. In addition, the project applicant, or its designee, shall provide 30 days advance written notice to the County and CDFG of the proposed conversion of its ongoing rangeland operations on Newhall Ranch to more intensive agricultural uses. The purpose of the advance notice requirement is to allow the applicant, or its designee, to coordinate with the County and CDFG to avoid or minimize significant impacts to the spineflower prior to the applicant's proposed conversion of its ongoing rangeland operations to more intensive agricultural uses. This coordination component will be implemented by or through the County's Department of Regional Planning and/or the Regional Manager of CDFG. Implementation will consist of the County and/or CDFG conducting a site visit of the proposed conversion area(s) within the 30-day period, and making a determination of whether the proposed conversion area(s) would destroy or significantly impact spineflower population in or adjacent to those areas. If it is determined that the conversion area(s) do not destroy or significantly impact spineflower populations, then the County and/or CDFG will authorize such conversion activities in the proposed conversion area(s). However, if it is determined that the conversion area(s) may destroy or significantly impact spineflower populations, then the County and/or CDFG will issue a stop work order to the applicant, or its designee. If such an order is issued, the applicant, or its designee, shall not proceed with any conversion activities in the proposed conversion area(s). However, the applicant, or the designee, may take steps to relocate the proposed conversion activities in an alternate conversion area(s). In doing so, the applicant, or its designee, shall follow the same notice and coordination provisions identified above. This conversion shall not include ordinary pasture maintenance and renovation or dry land farming operations consistent with rangeland management.	Applicant	Thirty (30) days advance written notice of proposed conversion to more intensive agricultural uses	1. LACDRP/CDFG 2. LACDRP/CDFG 3. As necessary
4.6 BIOTA (cont.)			
SAN MARTINEZ POPULATION			
4.6-80. Upon approval of tentative tract map(s) impacting the San Martinez portion of the Specific Plan site, the applicant shall work with the Department of Regional Planning staff and SEATAC to establish an appropriately sized preserve area to protect the spineflower population at San Martinez Canyon.	Applicant	Upon approval of tentative tract map(s) impacting San Martinez portion of site	1. LACDRP/CDFG 2. LACDRP/CDFG 3. As necessary

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.7 VISUAL QUALITIES Key mitigation measures incorporated into the Specific Plan include, but are not limited to: • the preservation of natural Santa Clara River vegetation and River bluffs, • the preservation of canyons tributary to the Santa Clara River and other Open Area, • the placement of the regional River Trail in between SR-126 and the River, • the regulation and limitation of urban uses between SR-126 and the River which create large windows for viewing the River Corridor, the River bluffs and Santa Susana Mountains from SR-126, • the preservation of the High Country SMA, • the preservation of significant topographic features, such as Sawtooth Ridge and Ayers Rock, • the installation of landscaping, and • the preservation of significant oak tree stands (less than 4 percent of the estimated 16,000+ oak trees would be impacted).			
4.7 VISUAL QUALITIES (cont.) Chapters 3 and 4 of the Specific Plan contain proposed Development Regulations and Design Guidelines, respectively. The reader is referred to those Chapters of the Specific Plan for the complete list. The Development Regulations and Design Guidelines are intended to provide a comprehensive set of regulations governing the use and development of land which is intended to achieve a development image that blends into adjoining natural landscapes and reduces the alteration of natural landforms and scenic natural features found on the Specific Plan site. The Specific Plan also includes landscape standards directing the use of drought-tolerant and native plants (including the replacement of removed oak trees) that would further highlight the surrounding natural environment. Development Regulations and Design Guidelines are proposed that address: • setbacks (Development Regulations, Specific Plan Chapter 3.4, Table 3.4-1), • building heights (Development Regulations, Specific Plan Chapter 3.4, Table 3.4-1), • signage (Development Regulations, Specific Plan Chapter 3.6), • parking (Development Regulations, Specific Plan Chapter 3.7), • site planning (Design Guidelines, Specific Plan Chapter 4.3), • architecture (Design Guidelines, Specific Plan Chapter 4.4), • fencing (Design Guidelines, Specific Plan Chapter 4.5), • landscape design (Design Guidelines, Specific Plan Chapter 4.6), • lighting (Design Guidelines, Specific Plan Chapter 4.7), and • grading (Design Guidelines, Specific Plan Chapter 4.8).			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.7-1. In conjunction with the development review process set forth in Chapter 5 of the Specific Plan, all future subdivision maps and other discretionary permits which allow construction shall incorporate the Development Guidelines (Specific Plan Chapter 3) and Design Guidelines (Specific Plan Chapter 4), and the design themes and view considerations listed in the Specific Plan.	Applicant	Plan Check	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Approval of Final Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.7 VISUAL QUALITIES (cont.)			
4.7-2. In design of residential tentative tract maps and site planning of multifamily areas and Commercial and Mixed-Use land use designations along SR-126, the following Design Guidelines shall be utilized. • Where the elevations of buildings will obstruct the views from SR-126 to the south, the location and configuration of individual buildings, driveways, parking, streets, signs and pathways shall be designed to provide view corridors of the River, bluffs and the ridge lines south of the River. Those view corridors may be perpendicular to SR-126 or oblique to it in order to provide for views of passengers within moving vehicles on SR-126. • The Community Park between SR 126 and the Santa Clara River shall be designed to promote views from SR-126 of the River, bluffs and ridge lines to the south of the River. • Residential Site Planning Guidelines set forth in Section 4.3.1 Residential and Architectural Guidelines set forth Section 4.4.1 Residential shall be employed to ensure that the views from SR-126 are aesthetically pleasing and that views of the River, bluffs and ridge lines south of the River are preserved to the extent practicable. • Mixed-Use and the Commercial Site Planning Guidelines set forth in Section 4.3.2 and Architectural Guidelines set forth Section 4.4.2 shall be incorporated to the extent practicable in the design of the Riverwood Village Mixed-Use and Commercial land use designations to ensure that the views from SR-126 are aesthetically pleasing and to preserve views of the River, bluffs and ridge lines south of the River. • Landscape improvements along SR 126 shall incorporate the Landscape Design Guidelines, set forth in Section 4.6 in order to ensure that the views from SR-126 are aesthetically pleasing and to preserve views of the River, bluffs and ridge lines south of the River.	Applicant	Plan Check	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Approval of Final Subdivision Maps or Site Plans as applicable

No further mitigation is recommended beyond that already incorporated into the Specific Plan. While the measures contained in the Specific Plan minimize the Specific Plan's visual impact, they cannot reduce the magnitude of the impact to less than significant levels.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.8 TRAFFIC/ACCESS			
ON-SITE (EXCEPT SR-126 - SEE BELOW)			
The following mitigation is required relative to all on-site roadways and intersections except SR-126, which is discussed separately below:			
4.8-1. The applicants for future subdivision maps which permit construction shall be responsible for funding and constructing all on-site traffic improvements except as otherwise provided below. The obligation to construct improvements shall not preclude the applicants' ability to seek local, State or Federal funding for these facilities.	Applicant(s)	Bonding of and/or Receipt of Funding and/or Field Verification of Construction	1. LACDPW 2. LACDPW 3. Prior to Issuance of Building Permit
4.8-2. Prior to the approval of each subdivision map which permits construction, the applicant for that map shall prepare a transportation performance evaluation which shall indicate the specific improvements for all on-site roadways which are necessary to provide adequate roadway and intersection capacity as well as adequate right-of-way for the subdivision and other expected traffic. Transportation performance evaluations shall be approved by Los Angeles County Department of Public Works according to standards and policies in effect at that time. The transportation performance evaluation shall form the basis for specific conditions of approval for the subdivision.	Applicant (Traffic Engineer)	Receipt and Review of Transportation Performance Evaluation	1. LACDPW 2. LACDPW 3. Prior to Approval of Subdivision Maps
4.8-3. The applicants for future subdivisions shall provide the traffic signals at the 15 locations labeled "B" through "P" in Figure 4.8-17 as well as any additional signals warranted by future subdivision design. Signal warrants shall be prepared as part of the transportation performance evaluations noted in **Mitigation 4.8-2.**	Applicant (Traffic Engineer)	Installation of Traffic Signals or funding of or bonding of project's share	1. LACDPW 2. LACDPW 3. Prior to Issuance of Occupancy Permits
4.8-4. All development within the Specific Plan shall conform to the requirements of the Los Angeles County Transportation Demand Management (TDM) Ordinance.	Applicant (Traffic Engineer)	Subdivision Review	1. LACDPW 2. LACDPW 3. Prior to Final Map Approval and/or approval of improvement plans

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.8 TRAFFIC/ACCESS (cont.)			
4.8-5. The applicants for all future subdivision maps which permit construction shall consult with the local transit provider regarding the need for, and locations of, bus pull-ins on highways within the Specific Plan area. All bus pull-in locations shall be approved by the Department of Public Works, and approved bus pull-ins shall be constructed by the applicant.	Applicant (Traffic Engineer)	Verification of Consultation with Transit Providers Review of bus pull-in locations	1. LACDPW 2. LACDPW 3. Prior to Final Map Approval and/or approval of improvement plans
OFF-SITE ARTERIALS			
4.8-6. Prior to the recordation of the first subdivision map which permits construction, the applicant for that map shall prepare a transportation performance evaluation which shall determine the specific improvements needed to each off-site arterial and related costs in order to provide adequate roadway and intersection capacity for the expected Specific Plan and General Plan buildout traffic trips. The transportation performance evaluation shall be based on the Master Plan of Highways in effect at that time and shall be approved by the Los Angeles County Department of Public Works. The applicant shall be required to fund its fair share of improvements to these arterials, as stated on **Table 4.8-18**. The applicants total funding obligation shall be equitably distributed over the housing units and non-residential building square footage (i.e., Business Park, Visitor-Serving, Mixed-Use, and Commercial) in the Specific Plan, and shall be a fee to be paid to the County and/or the City at each building permit. For off-site areas within the County unincorporated area, the applicant may construct improvements for credit against or in lieu of paying the fee.	Applicant(s)	Payment of Fee Determination of fair share funding obligation and fee structure for off-site improvements	1. LACDPW 2. LACDPW 3. Prior to Recordation of the First Subdivision Map

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.8 TRAFFIC/ACCESS (cont.)			
FREEWAYS AND STATE HIGHWAYS (I-5 AND SR-126 IN LOS ANGELES COUNTY)			
4.8-7. Each future performance evaluation which shows that a future subdivision map will create significant impacts on SR-126 shall analyze the need for additional travel lanes on SR-126. If adequate lane capacity is not available at the time of subdivision, the applicant of the subdivision shall fund or construct the improvements necessary to serve the proposed increment of development. Construction or funding of any required facilities shall not preclude the applicant's ability to seek State, Federal or local funding for these facilities.	Applicant(s)	Receipt and Review of Transportation Performance Evaluation Applicant Funding of or bonding of Fair Share of Improvements	1. LACDPW 2. LACDPW 3. Prior to Recordation of Final Tract Map

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.8 TRAFFIC/ACCESS (cont.)			
CONGESTION MANAGEMENT			
4.8-8. Project-specific environmental analysis for future subdivision maps which allow construction shall comply with the requirements of the Congestion Management Program in effect at the time that subdivision map is filed.	Applicant	Review of future environmental analysis	1. LACDPW 2. LACDPW 3. Prior to certification of future environmental documents
SR-126 IN VENTURA COUNTY			
4.8-9. Prior to the recordation of the first subdivision map which permits construction, the applicant for that map shall prepare a transportation evaluation including all of the Specific Plan land uses which shall determine the specific improvements needed to the following intersections with SR-126 in the City of Fillmore and community of Piru in Ventura County: "A", "B", "C", "D" and "E" Streets, Old Telegraph, Olive, Central, Santa Clara, Mountain View, El Dorado Road, and Pole Creek (Fillmore), and Main/Torrey and Center (Piru). The related costs of those intersection improvements and the project's fair share shall be estimated based upon the expected Specific Plan traffic volumes. The transportation performance evaluation shall be based on the Los Angeles County Master Plan of Highways in effect at that time and shall be approved by the Los Angeles County Department of Public Works. The applicant's total funding obligation shall be equitably distributed over the housing units and non-residential building square footage (i.e., Business Park, Visitor Center, Mixed Use, and Commercial) in the Specific Plan, and shall be a fee to be paid to the City of Fillmore and the County of Ventura at each building permit.	Applicant (Traffic Engineer)	Receipt and Review of Transportation Performance Evaluation Payment of Fee to City of Fillmore or County of Ventura	1. LACDPW 2. LACDPW 3. Prior to Recordation of the First Subdivision Map; Payment of Fee Prior to Issuance of Building Permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.8 TRAFFIC/ACCESS (cont.)			
FREEWAY/HIGHWAY INTERSECTIONS AND INTERCHANGES			
4.8-10. The Specific Plan is responsible to construct or fund its fair-share of the intersections and interchange improvements indicated on Table 4.8-18. Each future transportation performance evaluation required by **Mitigation Measure 4.8-2** which identifies a significant impact at these locations due to subdivision map-generated traffic shall address the need for additional capacity at each of these locations. If adequate capacity is not available at the time of subdivision map recordation, the performance evaluation shall determine the improvements necessary to carry Specific Plan generated traffic, as well as the fair share cost to construct such improvements. If the future subdivision is conditioned to construct a phase of improvements which results in an overpayment of the fair-share cost of the improvement, then an appropriate adjustment (offset) to the fees paid to Los Angeles County and/or City of Santa Clarita pursuant to **Mitigation Measure 4.8-6** above shall be made.	Applicant	Field Verification of Construction or Receipt of Fair Share Funding or Bonding	1. LACDPW 2. LACDPW 3. Prior to Issuance of Occupancy Permits
4.8-11. The applicant of the Newhall Ranch Specific Plan shall participate in an I-5 developer fee program, if adopted by the Board of Supervisors for the Santa Clarita Valley.	Applicant	Field Verification of Construction or Receipt of Fair Share Funding or Bonding	1. LACDPW 2. LACDPW 3. Prior to Issuance of Occupancy Permits
4.8-12. The applicant of the Newhall Ranch Specific Plan shall participate in a transit fee program, if adopted for the entire Santa Clarita Valley by Los Angeles County and City of Santa Clarita.	Applicant	Field Verification of Construction or Receipt of Fair Share Funding or Bonding	1. LACDPW 2. LACDPW 3. Prior to Issuance of Occupancy Permits
4.8 TRAFFIC/ACCESS (cont.)			
4.8-13. Prior to the approval of each subdivision map which permits construction, the applicant for that map shall prepare a traffic analysis approved by the Los Angeles County Department of Public Works. The analysis will assess project and cumulative development (including an existing plus cumulative development scenario under the County's Traffic Impact Analysis Report Guidelines (TIA) and its Development Monitoring System (DMS)). In response to the traffic analysis, the applicant may construct off-site traffic improvements for credit against, or in lieu of paying, the mitigation fees described in **Mitigation Measure 4.8-6** above. If future subdivision maps are developed in phases, a traffic study for each phase of the subdivision map may be submitted to determine the improvements needed to be constructed with that phase of development.	Applicant(s) (Project Traffic Engineer)	Receipt and Review of TIA and DMS Traffic Analysis Applicant Funding of or bonding of Fair Share of Improvements	1. LACDPW 2. LACDPW 3. Prior to Recordation of the Final Tract Map

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.9 NOISE			
CONSTRUCTION			
4.9-1. All construction activity occurring on the Newhall Ranch Specific Plan site shall adhere to the requirements of the "County of Los Angeles Construction Equipment Noise Standards," County of Los Angeles Ordinance No. 11743, §12.08.440 as identified in Table 4.9-3.	Applicant (Construction Contractor)	Include Measure in Specifications Field Verification With Noise Monitor	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. During Grading and Construction Activities
4.9-2. Limit all construction activities near occupied residences to between the hours of 6:30 A.M. and 8:00 P.M., and exclude all Sundays and legal holidays pursuant to County Department of Public Works, Construction Division standards.	Applicant (Construction Contractor)	Include Measure in Specifications Field Verification	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. During Grading and Construction Activities
4.9-3. When construction operations occur adjacent to occupied residential areas, implement appropriate additional noise reduction measures that include changing the location of stationary construction equipment, shutting off idling equipment, notifying adjacent residences in advance of construction work, and installing temporary acoustic barriers around stationary construction noise sources.	Applicant (Construction Contractor)	Include Measure in Specifications Field Verification and Verification that Adjacent Residents Were Notified	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. During Grading and Construction Activities
4.9-4. Locate construction staging areas on-site to maximize the distance between staging areas and occupied residential areas.	Applicant (Construction Contractor)	Include Measure in Specifications Field Verification	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. During Grading and Construction Activities

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.9 NOISE (cont.)			
OPERATION			
4.9-5. Where new single family residential buildings are to be constructed within an exterior noise contour of 60 dB(A) CNEL or greater, or where any multi-family buildings are to be constructed within an exterior noise contour of 65 dB(A) CNEL or greater, an acoustic analysis shall be completed prior to approval of building permits. The acoustical analysis shall show that the building is designed so that interior noise levels resulting from outside sources will be no greater than 45 dB(A) CNEL.	Applicant	Receipt and Review of Acoustical Analysis	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. Prior to the Issuance of Building Permits
4.9-6. For single family residential lots located within the 60 dB(A) CNEL or greater noise contour, an acoustic analysis shall be submitted prior to tentative approval of the subdivision. The acoustic analysis shall show that exterior noise in outdoor living areas (e.g., back yards, patios, etc.) will be reduced to 60 dB(A) CNEL or less.	Applicant	Receipt and Review of Acoustical Analysis	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. Prior to Tentative Approval of Subdivision
4.9-7. For multi-family residential lots located within the 65 dB(A) CNEL or greater noise contour, an acoustic analysis shall be submitted prior to tentative approval of the subdivision. The acoustic analysis shall show that exterior noise in outdoor living areas (e.g., back yards, patios, etc.) will be reduced to 65 dB(A) CNEL or less.	Applicant	Receipt and Review of Acoustical Analysis	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. Prior to Tentative Approval of Subdivision
4.9-8. For school sites located within the 70 dB(A) CNEL or greater noise contour, an acoustic analysis shall be submitted prior to tentative approval of the subdivision. The acoustic analysis shall show that noise at exterior play areas will be reduced to 70 dB(A) CNEL or less.	Applicant	Receipt and Review of Acoustical Analysis	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. Prior to Tentative Approval of Subdivision
4.9-9. All residential air conditioning equipment installed within the Newhall Ranch Specific Plan site shall adhere to the requirements of the "County of Los Angeles Residential Air Conditioning and Refrigeration Noise Standards," County of Los Angeles Ordinance No. 11743, §12.08.530.	Building Contractor	Field Verification	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. Prior to the Issuance of Occupancy Permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.9 NOISE (cont.)			
4.9-10. All stationary and point sources of noise occurring on the Newhall Ranch Specific Plan site shall adhere to the requirements of the County of Los Angeles Ordinance No. 11743, §12.08.390 as identified in Table 4.9-2, County of Los Angeles Exterior Noise Standards for Stationary and Point Noise Sources.	Future Owners/ Operators within project	Field Verification	1. LA County Department of Health Services 2. LA County Department of Building and Safety 3. During Life of Project
4.9-11. Loading, unloading, opening, closing, or other handling of boxes, crates, containers, building materials, garbage cans or similar objects between the hours of 10:00 P.M. and 6:00 A.M. in such a manner as to cause a noise disturbance is prohibited in accordance with the County of Los Angeles Ordinance No. 11743, §12.08.460.	Future Owners/ Operators within project	Field Verification	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. During Life of Project
4.9-12. Loading zones and trash receptacles in commercial and Business Park areas shall be located away from adjacent residential areas, or provide attenuation so that noise levels at residential uses do not exceed the standards identified in §12.08.460 of the Ordinance No. 11743.	Applicant	Plan Check Field Verification	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. Prior to Approval of Final Maps or improvement/building plans and Verify Prior to Issuance of Occupancy Permits
4.9-13. Where residential lots are located with direct lines of sight to the Magic Mountain Theme Park, an acoustic analysis shall be submitted to show that exterior noise on the residential lots generated by activities at the park do not exceed the standards identified in §12.08.390 of the Ordinance No. 11743 as identified in Table 4.9-2, County of Los Angeles Exterior Noise Standards for Stationary and Point Noise Sources.	Applicant	Receipt and Review of Acoustical Analysis	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. Prior to the Issuance of Building Permits
4.9-14. After the time that occupancy of uses on the Newhall Ranch Specific Plan site occurs, AND when noise levels at the Travel Village RV Park reach 70 dB(A) CNEL at locations where recreational vehicles are inhabited, the applicant shall construct a noise abatement barrier to reduce noise levels at the RV Park to 70 dB(A) CNEL or less.	Applicant	Receipt and Review of Acoustical Analysis Field Verification	1. LA County Department of Health Services 2. LACDPW, Building and Safety 3. Upon Occupancy of Uses on Newhall Ranch and if/when noise levels in Travel Village reach 70 dB(A) CNEL

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.9 NOISE (cont.)			
4.9-15. Despite the absence of a significant impact, applicants for all building permits of Residential, Mixed-Use, Commercial, and Business Park land uses (Project) shall pay to the Santa Clara Elementary School District, prior to issuance of building permits, the project's pro rata share of the cost of a sound wall to be located between SR-126 and the Little Red School House. The project's pro rata share shall be determined by multiplying the estimated cost of the sound wall by the ratio of the project's estimated contribution of average daily trips on SR-126 (ADT) at the Little Red School House (numerator) to the total projected cumulative ADT increase at that location (denominator).[1] The total projected cumulative ADT increase shall be determined by subtracting the existing trips on SR-126[2] from the projected cumulative trips as shown in Table 1 of Topical Response 5 - Traffic Impacts to State and Local Roads in Ventura County after adding the total Newhall Ranch ADT traveling west of the City of Fillmore.	Applicants for all Building Permits	Payment to Santa Clara Elementary School District	1. LACDRP 2. LACDPW, Building and Safety 3. Upon Issuance of Building Permits
4.9-16. Despite the absence of a significant impact, the applicant for all building permits of Residential, Mixed-Use, Commercial and Business Park land uses (Project) shall participate on a fair-share basis in noise attenuation programs developed and implemented by the City of Moorpark to attenuate vehicular noise on SR-23 just north of Casey Road for the existing single-family homes which front SR-23. The mitigation criteria shall be to reduce noise levels to satisfy State noise compatibility standards. The project's pro rata share shall be determined by multiplying the estimated cost of attenuation by the ratio of the project's estimated contribution of average daily trips on SR-23 (ADT) north of the intersection of SR-23 and Casey Road (numerator) to the total projected cumulative ADT increase at that location (denominator).[3] The total projected cumulative ADT increase shall be determined by subtracting the existing trips on SR-23 north of Casey Road[4] from the projected cumulative trips as shown in Topical Response 5 - Traffic Impacts to State and Local Roads in Ventura County after adding the total Newhall Ranch ADT traveling south of the City of Fillmore.	Applicants for all Building Permits	Payment to City of Moorpark	1. LACDRP 2. LACDPW, Building and Safety 3. Upon Issuance of Building Permits

[1] Cost of Sound Wall X (Project ADT on SR-126 @ LRSH*/Total Projected Cumulative ADT Increase on SR-126 @ LRSH*) * LRSH = Little Red School House.

[2] 25,165 ADT using linear extrapolation from Table 1 of Topical Response 5 - Traffic Impacts to State and Local Roads in Ventura County.

[3] Cost of mitigation x (Project ADT on SR-23 north of Casey Road/Total Projected cumulative ADT Increase on SR-23 north of Casey Road).

[4] ADT using linear extrapolation from Table 1 of Topical Response 5 - Traffic Impacts to State and Local Roads in Ventura County.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.9 NOISE (cont.)			
4.9-17. Prior to the approval of any subdivision map which permits construction within the Specific Plan area, the applicant for that map shall prepare an acoustical analysis assessing project and cumulative development (including an existing plus project analysis, and an existing plus cumulative development analysis including the project). The acoustical analysis shall be based upon State noise land use compatibility criteria and shall be approved by the Los Angeles County Department of Health Services. In order to mitigate any future impacts resulting from the project's contribution to significant cumulative noise impacts to development in existence as of the adoption of the Newhall Ranch Specific Plan and caused by vehicular traffic on off-site roadways, the applicant for building permits of Residential, Mixed-Use, Commercial, Visitor Serving and Business Park land uses shall, prior to issuance of building permits, pay a fee to Los Angeles County, Ventura County, the City of Fillmore or the City of Santa Clarita. The amount of the fee shall be the project's fair-share under any jurisdiction-wide or Santa Clarita Valley-wide noise programs adopted by any of the above jurisdictions.	Applicants for all Building Permits	Payment of Fee to Los Angeles County, Ventura County, City of Fillmore or the City of Santa Clarita	1. LACDRP 2. Los Angeles Co. Department of Health Services 3. Upon Issuance of Building Permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY			
As discussed in Draft EIR, the proposed Specific Plan includes an on-site mobility system with alternatives to automobile use. Bus transit service within the Santa Clarita Valley currently provides linkages to the MetroLink rail station located on Soledad Canyon Road in the City of Santa Clarita, as well as to major commercial and other high activity centers within the Santa Clarita Valley. As set forth in Specific Plan, bus pull-ins will be provided throughout the Newhall Ranch Specific Plan site. Transit service is expected to serve the site when the demand for service justifies the extension of service to the area. The bus transit system will serve to implement SCAQMD mitigation measures pertaining to the establishment of shuttles from the Specific Plan site to commercial core areas and to major rail transit centers. In addition, the Specific Plan incorporates a variety of design concepts, which will reduce total vehicle miles traveled and encourage alternative modes of transportation. These features include Mixed-Use areas, the location of employment centers in proximity to residential areas, and trails, which will accommodate bicycles and pedestrians, which link employment centers and commercial areas. The Specific Plan also reserves land for a future rail right-of-way and an area has been identified for a future transit station within the Specific Plan area. The Specific Plan is designed to reduce vehicle miles traveled through encouraging alternative modes of travel and allowing for residents to work, shop, and recreate in close proximity to their homes. The Specific Plan would be built out over an estimated 25-year period. It is unknown at this time what technological developments may take place that may affect the identification and implementation of mitigation measures; however, preliminary information is available on the direction that these developments appear to be taking. Projects planned today should be able to integrate improvements, which facilitate use of new technologies as they become commercially available. For example, several alternatives to gasoline-powered vehicles are being developed today. Fuel cells which generate little, if any, pollutant emissions are being designed and tested as means to supply energy, heat, and cooling for structures. The potential application of measures such as these to reduce emissions should be studied as they become readily available and economically viable. However, with regard to "a fuel cell program for the commercial and industrial buildings", there is no supportable evidence that such a mitigation measure is economically achievable and therefore feasible. Nor is any data available to demonstrate that such a measure would have a measurable or significant effect on reducing air emissions. In addition, Los Angeles County is not aware of any objective data demonstrating that such a measure, if implemented, would measurably reduce air emissions. SCAQMD's CEQA Air Quality Handbook does not recommend this measure for non-residential land uses. For all these reasons, Los Angeles County rejects this measure as infeasible.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY (cont.)			
However, the following features have been incorporated as part of the Specific Plan to reduce motor vehicle trips:			
4.10-1. The Specific Plan will provide Commercial and Service uses in close proximity to residential subdivisions.	Applicant	Approval of Tentative Maps	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals
4.10-2. The Specific Plan will locate residential uses in close proximity to Commercial uses, Mixed-Uses, and Business Parks.	Applicant	Approval of Tentative Maps	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals
4.10-3. Bus pull-ins will be constructed throughout the Specific Plan site.	Applicant	Final Highway Plan Check	1. LACDPW 2. LACDPW 3. Prior to Tentative Subdivision Map Approvals
4.10-4. Pedestrian facilities, such as sidewalks, and community regional, and local trails, will be provided throughout the Specific Plan site.	Applicant	Submittal of Tentative Maps	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals
4.10-5. Roads with adjacent trails for pedestrian and bicycle use will be provided throughout the Specific Plan site connecting the individual Villages and community.	Applicant	Submittal of Tentative Maps	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY (cont.)			
CONSTRUCTION IMPACTS			
4.10-6. The applicant of future subdivisions shall implement all rules and regulations adopted by the Governing Board of the SCAQMD which are applicable to the development of the subdivision (such as Rule 402 - Nuisance, Rule 403 - Fugitive Dust, Rule 1113 - Architectural Coatings) and which are in effect at the time of development. The purpose of Rule 403 is to reduce the amount of particulate matter entrained in the ambient air as a result of man-made fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. Rule 403 applies to any activity or man-made condition capable of generating fugitive dust such as the mass and remedial grading associated with the project as well as weed abatement and stockpiling of construction materials (i.e., rock, earth, gravel). Rule 403 requires that grading operations either (1) take actions specified in Tables 1 and 2 of the Rule for each applicable source of fugitive dust and take certain notification and record keeping actions; or (2) obtain an approved Fugitive Dust Control Plan. A complete copy of the SCAQMD's Rule 403 Implementation Handbook, which has been included in Appendix 4.10, provides guideline tables to demonstrate the typical mitigation program and record keeping required for grading operations (Tables 1 and 2 and sample record keeping chart). The record keeping is accomplished by on-site construction personnel, typically the construction superintendent. Each future subdivision proposed in association with the Newhall Ranch Specific Plan shall implement the following if found applicable and feasible for that subdivision:	Applicant	Plan Check Review and apply applicable rules as part of environmental document	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals
GRADING a. Apply non-toxic soil stabilizers according to manufacturers' specification to all inactive construction areas (previously graded areas inactive for ten days or more). b. Replace groundcover in disturbed areas as quickly as possible.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY (cont.)			
4.10-6. (cont.)			
c. Enclose, cover, water twice daily, or apply non-toxic soil binders according to manufacturers' specifications, to exposed piles (i.e., gravel, sand, dirt) with 5 percent or greater silt content.			
d. Water active sites at least twice daily.			
e. Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 mph.			
f. Monitor for particulate emissions according to District-specified procedures.			
g. All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer) in accordance with the requirements of CVC Section 23114.			
PAVED ROADS			
h. Sweep streets at the end of the day if visible soil material is carried onto adjacent public paved roads (recommend water sweepers with reclaimed water).			
i. Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip.			
UNPAVED ROADS			
j. Apply water three times daily, or non-toxic soil stabilizers according to manufacturers' specifications, to all unpaved parking or staging areas or unpaved road surfaces.			
k. Reduce traffic speeds on all unpaved roads to 15 mph or less.			
l. Pave construction roads that have a traffic volume of more than 50 daily trips by construction equipment, 150 total daily trips for all vehicles.			
m Pave all construction access roads at least 100 feet on to the site from the main road.			
n. Pave construction roads that have a daily traffic volume of less than 50 vehicular trips.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY (cont.)			
4.10-7. Prior to the approval of each future subdivision proposed in association with the Newhall Ranch Specific Plan, each of the construction emission reduction measures indicated below (and in Tables 11-2 and 11-3 of the SCAQMD's CEQA Air Quality Handbook, as amended) shall be implemented if found applicable and feasible for that subdivision. Tables of currently applicable measures are provided for reference in EIR Appendix 4.10.	Applicant	Field Verification and review and include applicable and feasible rules as part of environmental document	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals
ON-ROAD MOBILE SOURCE CONSTRUCTION EMISSIONS: a. Configure construction parking to minimize traffic interference. b. Provide temporary traffic controls when construction activities have the potential to disrupt traffic to maintain traffic flow (e.g., signage, flag person, detours). c. Schedule construction activities that affect traffic flow to off-peak hours (e.g., between 7:00 P.M. and 6:00 A.M. and between 10:00 A.M. and 3:00 P.M.). d. Develop a trip reduction plan to achieve a 1.5 average vehicle ridership (AVR) for construction employees. e. Implement a shuttle service to and from retail services and food establishments during lunch hours. f. Develop a construction traffic management plan that includes the following measures to address construction traffic that has the potential to affect traffic on public streets: - Rerouting construction traffic off congested streets; - Consolidating truck deliveries; and - Providing temporary dedicated turn lanes for movement of construction trucks and equipment on and off of the site. g. Prohibit truck idling in excess of two minutes.			
OFF-ROAD MOBILE SOURCE CONSTRUCTION EMISSIONS: h. Use methanol-fueled pile drivers. i. Suspend use of all construction equipment operations during second stage smog alerts. j. Prevent trucks from idling longer than two minutes. k. Use electricity from power poles rather than temporary diesel-powered generators. l. Use electricity from power poles rather than temporary gasoline-powered generators. m Use methanol- or natural gas-powered mobile equipment instead of diesel. n. Use propane- or butane-powered on-site mobile equipment instead of gasoline.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY (cont.)			
OPERATION IMPACTS			
The following measures based on current technology and feasibility will be implemented to reduce the operational emissions of the Specific Plan.			
4.10-8. The applicant of future subdivisions shall implement all rules and regulations adopted by the Governing Board of the SCAQMD which are applicable to the development of the subdivision (such as Rule 402 - Nuisance, Rule 1102 - Petroleum Solvent Dry Cleaners, Rule 1111 - NOx Emissions from Natural Gas-Fired, Fan-Type Central Furnaces, Rule 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters) and which are in effect at the time of occupancy permit issuance.	Applicant	Field Verification and review and include applicable and feasible rules as part of environmental document	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals
4.10-9. Prior to the approval of each future subdivision proposed in association with the Newhall Ranch Specific Plan, each of the operational emission reduction measures indicated below (and in Tables 11-6 and 11-7 of the SCAQMD's CEQA Air Quality Handbook, as amended) shall be implemented if found applicable and feasible for that subdivision. Tables of currently applicable measures are provided for reference in Appendix 4.10.	Applicant	Field Verification and review and include applicable and feasible rules as part of environmental document	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals
ON-ROAD MOBILE SOURCE OPERATIONAL EMISSIONS:			
RESIDENTIAL USES a. Include satellite telecommunications centers in residential subdivisions. b. Establish a shuttle service from residential subdivisions to commercial core areas. c. Construct on-site or off-site bus stops (e.g., bus turnouts, passenger benches, and shelters). d. Construct off-site pedestrian facility improvements, such as overpasses and wider sidewalks. e. Include retail services within or adjacent to residential subdivisions. f. Provide shuttles to major rail transit centers or multi-modal stations. g. Contribute to regional transit systems (e.g., right-of-way, capital improvements, etc.). h. Synchronize traffic lights on streets impacted by development. i. Construct, contribute, or dedicate land for the provision of off-site bicycle trails linking the facility to designated bicycle commuting routes.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY (cont.)			
4.10-9. (cont.) **COMMERCIAL USES** j. Provide preferential parking spaces for carpools and vanpools and provide 7′2″ minimum vertical clearance in parking facilities for vanpool access. k. Implement on-site circulation plans in parking lots to reduce vehicle queuing. l. Improve traffic flow at drive-throughs by designing separate windows for different functions and by providing temporary parking for orders not immediately available for pickup. m Provide video-conference facilities. n. Set up resident worker training programs to improve job/housing balance. o. Implement home dispatching system where employees receive routing schedule by phone instead of driving to work. p. Develop a program to minimize the use of fleet vehicles during smog alerts (for business not subject to Regulation XV (now Rule 2202) or XII). q. Use low-emissions fleet vehicles: - TLEV - ULEV - LEV - ZEV r. Reduce employee parking spaces for those businesses subject to Regulation XV (now Rule 2202). s. Implement a lunch shuttle service from a worksite(s) to food establishments. t. Implement compressed work-week schedules where weekly work hours are compressed into fewer than five days. - 9/80 - 4/40 - 3/36 u. Develop a trip reduction plan to achieve 1.5 AVR for businesses with less than 100 employees or multi-tenant worksites. v. Utilize satellite offices rather than regular worksite to reduce VMT. w. Establish a home-based telecommuting program. x. Provide on-site child care and after-school facilities or contribute to off-site development within walking distance.	Applicant	Field Verification and review and include applicable and feasible rules as part of environmental document	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY (cont.)			
4.10-9. (cont.) y. Require retail facilities or special event centers to offer travel incentives such as discounts on purchases for transit riders. z. Provide on-site employee services such as cafeterias, banks, etc. aa. Establish a shuttle service from residential core areas to the worksite. ab. Construct on-site or off-site bus stops (e.g., bus turnouts, passenger benches, and shelters). ac. Implement a pricing structure for single-occupancy employee parking and/or provide discounts to ridesharers. ad. Include residential units within a commercial project. ae. Utilize parking in excess of code requirements as on-site park-n-ride lots or contribute to construction of off-site lots. af. Any two of the following: - Construct off-site bicycle facility improvements, such as bicycle trails linking the facility to designated bicycle commuting routes, or on-site improvements, such as bicycle paths. - Include bicycle parking facilities, such as bicycle lockers and racks. - Include showers for bicycling employees' use. ag. Any two of the following: - Construct off-site pedestrian facility improvements, such as overpasses, wider sidewalks. - Construct on-site pedestrian facility improvements, such as building access which is physically separated from street and parking lot traffic and walk paths. - Include showers for pedestrian employees' use. ah. Provide shuttles to major rail transit stations and multi-modal centers. ai. Contribute to regional transit systems (e.g., right-of-way, capital improvements, etc.). aj. Charge visitors to park. ak. Synchronize traffic lights on streets impacted by development. al. Reschedule truck deliveries and pickups to off-peak hours. am. Set up paid parking systems where drivers pay at walkup kiosk and exit via a stamped ticket to reduce emissions from queuing vehicles. an. Require on-site truck loading zones. ao. Implement or contribute to public outreach programs. ap. Require employers not subject to Regulation XV (now Rule 2202) to provide commuter information area.	Applicant	Field Verification and review and include applicable and feasible rules as part of environmental document	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY (cont.)			
4.10-9. (cont.) **BUSINESS PARK USES** aq. Provide preferential parking spaces for carpools and vanpools and provide 7'2" minimum vertical clearance in parking facilities for vanpool access. ar. Implement on-site circulation plans in parking lots to reduce vehicle queuing. as. Set up resident worker training programs to improve job/housing balance. at. Implement home dispatching system where employees receive routing schedule by phone instead of driving to work. au. Develop a program to minimize the use of fleet vehicles during smog alerts (for business not subject to Regulation XV (now Rule 2202) or XII). av. Use low-emissions fleet vehicles: - TLEV - ULEV - LEV - ZEV aw. Require employers not subject to Regulation XV (now Rule 2202) to provide commuter information area. ax. Reduce employee parking spaces for those businesses subject to Regulation XV (now Rule 2202). ay. Implement compressed work-week schedules where weekly work hours are compressed into fewer than five days. - 9/80 - 4/40 - 3/36 az. Offer first right of refusal, low interest loans, or other incentives to employees who purchase or rent local residences. ba. Develop a trip reduction plan to achieve 1.5 AVR for businesses with less than 100 employees or multi-tenant worksites. bb. Provide on-site child care and after-school facilities or contribute to off-site development within walking distance. bc. Provide on-site employee services such as cafeterias, banks, etc. bd. Establish a shuttle service from residential core areas to the worksite. be. Construct on-site or off-site bus stops (e.g., bus turnouts, passenger benches, and shelters)	Applicant	Field Verification and review and include applicable and feasible rules as part of environmental document	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY (cont.)			
4.10-9. (cont.) bf. Implement a pricing structure for single-occupancy employee parking and/or provide discounts to ridesharers. bg. Utilize parking in excess of code requirements as on-site park-n-ride lots or contribute to construction of off-site lots. bh. Any two of the following: - Construct off-site bicycle facility improvements, such as bicycle trails linking the facility to designated bicycle commuting routes, or on-site improvements, such as bicycle paths. - Include bicycle parking facilities, such as bicycle lockers and racks. - Include showers for bicycling employees' use. bi. Any two of the following: - Construct off-site pedestrian facility improvements, such as overpasses, wider sidewalks. - Construct on-site pedestrian facility improvements, such as building access which is physically separated from street and parking lot traffic and walk paths. - Include showers for pedestrian employees' use. bj. Provide shuttles to major rail transit stations and multi-modal centers. bk. Contribute to regional transit systems (e.g., right-of-way, capital improvements, etc.). bl. Synchronize traffic lights on streets impacted by development. bm. Reschedule truck deliveries and pickups to off-peak hours. bn. Implement a lunch shuttle service from a worksite(s) to food establishments. bo. Require on-site truck loading zones. bp. Install aerodynamic add-on devices to heavy-duty trucks. bq. Implement or contribute to public outreach programs.	Applicant	Field Verification and review and include applicable and feasible rules as part of environmental document	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals
STATIONARY SOURCE OPERATIONAL EMISSIONS			
RESIDENTIAL USES br. Use solar or low emission water heaters. bs. Use central water heating systems. bt. Use built-in energy-efficient appliances. bu. Provide shade trees to reduce building heating/cooling needs. bv. Use energy-efficient and automated controls for air conditioners. bw. Use double-paned windows. bx. Use energy-efficient low-sodium parking lot lights.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY (cont.)			
4.10-9. (cont.) **COMMERCIAL USES** by. Use lighting controls and energy-efficient lighting. bz. Use fuel cells in residential subdivisions to produce heat and electricity. ca. Orient buildings to the north for natural cooling and include passive solar design (e.g., daylighting). cb. Use light-colored roofing materials to reflect heat. cc. Increase walls and attic insulation beyond Title 24 requirements. cd. Use solar or low emission water heaters. ce. Use central water heating systems. cf. Provide shade trees to reduce building heating/cooling needs. cg. Use energy-efficient and automated controls for air conditioners. ch. Use double-paned windows. ci. Use energy-efficient low-sodium parking lot lights. cj. Use lighting controls and energy-efficient lighting. ck. Use light-colored roofing materials to reflect heat. cl. Increase walls and attic insulation beyond Title 24 requirements. cm. Orient buildings to the north for natural cooling and include passive solar design (e.g., daylighting). **BUSINESS PARK USES** cn. Provide shade trees to reduce building heating/cooling needs. co. Use energy-efficient and automated controls for air conditioning. cp. Use double-paned windows. cq. Use energy-efficient low-sodium parking lot lights. cr. Use lighting controls and energy-efficient lighting. cs. Use light-colored roofing materials to reflect heat. ct. Orient buildings to the north for natural cooling and include passive solar design (e.g., daylighting). cu. Increase walls and attic insulation beyond Title 24 requirements. cv. Improved storage and handling or source materials. cw. Materials substitution (e.g., use water-based paints, life-cycle analysis). cx. Modify manufacturing processes (e.g., reduce process stages, closed-loop systems, materials recycling). cy. Resource recovery systems that redirect chemicals to new production processes.	Applicant	Field Verification and review and include applicable and feasible rules as part of environmental document	1. LACDRP 2. LACDRP 3. Prior to Tentative Subdivision Map Approvals

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.10 AIR QUALITY (cont.)			
4.10-10. All non-residential development of 25,000 gross square feet or more shall comply with the County's Transportation Demand Management (TDM) Ordinance (Ordinance No. 93-0028M) in effect at the time of subdivision. The sizes and configurations of the Specific Plan's non-residential uses are not known at this time and the Ordinance specifies different requirements based on the size of the project under review. All current provisions of the ordinance are summarized in Appendix 4.10.	Applicant	Include Requirement in Future environmental documents and/or check at Building Permit	1. LACDPW 2. LACDRP 3. Tentative Map Approval or Building Permit, as applicable
4.10-11. Subdivisions and buildings shall comply with Title 24 of the California Code of Regulations which are current at the time of development.	Applicant	Include Requirement in Future environmental documents and/or check at Building Permit	1. LACDPW, Building and Safety 2. LACDPW, Building and Safety 3. Tentative Map Approval or Building Permit, as applicable
4.10-12. Lighting for public streets, parking areas, and recreation areas shall utilize energy efficient light and mechanical, computerized or photo cell switching devices to reduce unnecessary energy usage.	Applicant	Include Requirement in Future environmental documents and/or check at Building Permit	1. LACDPW 2. LACDPW 3. Tentative Map Approval or Building Permit, as applicable
4.10-13. Any on-site subterranean parking structures shall provide adequate ventilation systems to disperse pollutants and preclude the potential for a pollutant concentration to occur.	Applicant	Include Requirement in Future environmental documents and/or check at Building Permit	1. LACDPW 2. LACDPW 3. Tentative Map Approval or Building Permit, as applicable
4.10-14. The sellers of new residential units shall be required to distribute brochures and other relevant information published by the SCAQMD or similar organization to new homeowners regarding the importance of reducing vehicle miles traveled and related air quality impacts, as well as on local opportunities for public transit and ridesharing.	Applicant	LACDRP Review of information package and distribution records	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Issuance of Building Permit (Package) and Occupancy Permits (Records)

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.11 WATER RESOURCES			
4.11-1. The proposed Specific Plan shall implement a water reclamation system in order to reduce the Specific Plan's demand for imported potable water. The Specific Plan shall install a distribution system to deliver non-potable reclaimed water to irrigate land uses suitable to accept reclaimed water, pursuant to Los Angeles County Department of Health Standards.	Applicant	Subdivision Map Improvement Plan Check	1. LACDRP 2. LACDPW 3. Prior to Issuance of Building Permit(s)
4.11-2. Landscape concept plans shall include a palette rich in drought-tolerant and native plants.	Applicant	Preliminary Landscape Plan Review	1. LACDPW 2. LA County Fire Department or Parks and Recreation 3. Prior to Recordation of Final Map
4.11-3. Major manufactured slopes shall be landscaped with materials that will eventually naturalize, requiring minimal irrigation.	Applicant	Preliminary Landscape Plan Review	1. LACDPW 2. LA County Fire Department or Parks and Recreation 3. Prior to Recordation of Final Map
4.11-4. Water conservation measures as required by the State of California shall be incorporated into all irrigation systems.	Applicant	Architectural Plans	1. California Department of Conservation 2. LACDPW, Building and Safety 3. Prior to Issuance of Building Permit(s)
4.11-5. The area within each future subdivision within Newhall Ranch shall be annexed to the Valencia Water Company prior to issuance of building permits.	Applicant	CPUC Annexation Approval	1. CPUC 2. LACDPW, Building and Safety 3. Prior to Issuance of Building Permit(s)

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.11 WATER RESOURCES (cont.)			
4.11-6. In conjunction with the submittal of applications for tentative tract maps or parcel maps which permit construction, and prior to approval of any such tentative maps, and in accordance with the requirements of the Los Angeles County General Plan Development Monitoring System (DMS), as amended, Los Angeles County shall require the applicant of the map to obtain written confirmation from the retail water agency identifying the source(s) of water available to serve the map concurrent with need. If the applicant of such map cannot obtain confirmation that a water source(s) is available for buildout of the map, the map shall be phased with the timing of an available water source(s), consistent with the County's DMS requirements.	Applicant	Written Confirmation of Water Availability	1. LACDPW 2. LACDPW 3. Prior to Recordation of Final Subdivision Maps
4.11-7. Prior to commencement of use, all uses of recycled water shall be reviewed and approved by the State of California Health and Welfare Agency, Department of Health Services.	Applicant	Plan Check	1. County Department of Health Services 2. LACDPW, Building and Safety 3. Prior to Issuance of Grading or Occupancy Permit(s) as applicable
4.11-8. Prior to the issuance of building permits that allow construction, the applicant of the subdivision shall finance the expansion costs of water service extension to the subdivision through the payment of connection fees to the appropriate water agency(ies).	Applicant	Payment of Connection Fees	1. CLWA/VWC 2. LACDPW, Building and Safety 3. Prior to Issuance of Building Permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.11 WATER RESOURCES (cont.)			
4.11-9. Pursuant to Public Resources Code §21081(a)(2), the County shall recommend that the Upper Santa Clara Water Committee (or Santa Clarita Valley Water Purveyors), made up of the Castaic Lake Water Agency, Los Angeles County Waterworks District No. 36, Newhall County Water District, Santa Clarita Water Division of CLWA and the Valencia Water Company, prepare an annual water report that will discuss the status of groundwater within the Alluvial and Saugus Aquifers, and State Water Project water supplies as they relate to the Santa Clarita Valley. The report will also include an annual update of the actions taken by CLWA to enhance the quality and reliability of existing and planned water supplies for the Santa Clarita Valley. In those years when the Committee or purveyors do not prepare such a report, the applicant at its expense shall cause the preparation of such a report that is acceptable to the County to address these issues. This annual report shall be provided to Los Angeles County who will consider the report as part of its local land use decision-making process. (To date, four such water reports have been prepared (1998, 1999, 2000 and 2001) and provided to both the County of Los Angeles and the City of Santa Clarita.)	Applicant	Receipt of Annual Report	1. Board of Supervisors 2. LACDRP 3. Prior to Recordation of Final Subdivision Maps

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.11 WATER RESOURCES (cont.)			
4.11-10. Pursuant to Public Resources Code §21081(a)(2), the County shall recommend that Castaic Lake Water Agency (CLWA), in cooperation with other Santa Clarita Valley retail water providers, continue to update the Urban Water Management Plan (UWMP) for Santa Clarita Valley once every five years (on or before December 31) to ensure that the County receives up-to-date information about the existing and planned water supplies in the Santa Clarita Valley. The County will consider the information contained in the updated UWMP in connection with the County's future local land use decision-making process. The County will also consider the information contained in the updated UWMP in connection with the County's future consideration of any Newhall Ranch tentative subdivision maps allowing construction. (see**, Mitigation Measure 4.11-15**, below.)	Applicant	Receipt of written identification of water service from retailer	1. Board of Supervisors 2. LACDRP 3. Prior to Recordation of Final Subdivision Maps
4.11-11. With implementation of the proposed Saugus ASR program, ASR wells shall be spaced so that adjacent non-project wells will not lose pumping capacity as a result of drawdown occurring during pumping of the ASR wells.	Applicant	Receipt of written report addressing proposed and existing well locations, and effects on adjacent wells	1. LACDPW 2. LACDPW 3. Concurrent with Submittal of Application for Saugus ASR Program

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.11 WATER RESOURCES (cont.)			
4.11-12. With implementation of the proposed Saugus ASR program, the ultimate number of ASR wells to be constructed shall be sufficient to inject the ultimate target injection volume of 4,500 acre-feet per year and withdraw the ultimate target withdraw volume of 4,100 acre-feet per year.	Applicant	Receipt of written report from ASR program engineer	1. LACDRPW 2. LACDRPW 3. Concurrent with Submittal of Application for Tentative Tract Maps which permit construction.
4.11-13. With implementation of the proposed Saugus ASR program, ASR wells shall be constructed in the following two general areas: (a) South of the Santa Clara River and west of Interstate 5. This location includes areas within the Newhall Ranch Specific Plan boundary. (This area is referred to as the "south ASR well field".); and (b) North of the Santa Clara River and west of Castaic Creek. (This location is referred to as the "north ASR well field.")	Applicant	Receipt of written report from ASR program engineer indicating well locations	1. LACDRPW 2. LACDRPW 3. Concurrent with Submittal of Application for Tentative Tract Maps which permit construction.
4.11-14. The Saugus Groundwater Banking/ASR program injection water must meet the water quality requirements of the State Regional Water Quality Control Board, Los Angeles Region. The water extracted for use on the Specific Plan site shall meet the Title 22 drinking water standards of the State Department of Health Services.	Applicant	Receipt of written report on water quality from ASR program engineer	1. LACDRPW 2. LACDRPW 3. Concurrent with Submittal of Application for Tentative Tract Maps which permit construction.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.11 WATER RESOURCES (cont.)			
4.11-15. Groundwater historically and presently used for crop irrigation on the Newhall Ranch Specific Plan site and elsewhere in Los Angeles County shall be made available by the Newhall Land and Farming Company, or its assignee, to partially meet the potable water demands of the Newhall Ranch Specific Plan. The amount of groundwater pumped for this purpose shall not exceed 7,038 AFY. This is the amount of groundwater pumped historically and presently by the Newhall Land and Farming Company in Los Angeles County to support its agricultural operations. Pumping this amount will not result in a net increase in groundwater use in the Santa Clarita Valley. To monitor groundwater use, the Newhall Land and Farming Company, or its assignee, shall provide the County an annual report indicating the amount of groundwater used in Los Angeles County and the specific land upon which that groundwater was historically used for irrigation. For agricultural land located off the Newhall Ranch Specific Plan site in Los Angeles County, at the time agricultural groundwater is transferred from agricultural uses on that land to Specific Plan uses, The Newhall Land and Farming Company, or its assignee, shall provide a verified statement to the County's Department of Regional Planning that Alluvial aquifer water rights on that land will now be used to meet Specific Plan demand.	Applicant	Receipt of written identification of water service provider or applicant	1. Board of Supervisors 2. LACDRP 3. Prior to Recordation of Final Subdivision Maps
4.11-16. The agricultural groundwater used to meet the needs of the Specific Plan shall meet the drinking water quality standards required under Title 22 prior to use.	Applicant	Receipt of written report on water quality from ASR program engineer	1. LACDPW 2. LACDRP 3. Concurrent with Submittal of Application for Tentative Tract Maps which permit construction.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.11 WATER RESOURCES (cont.)			
4.11-17. In conjunction with each project-specific subdivision map for the Newhall Ranch Specific Plan, the County shall require the applicant of that map to cause to be prepared a supplemental or subsequent Environmental Impact Report, as appropriate, pursuant to CEQA requirements. By imposing this EIR requirement on each Newhall Ranch tentative subdivision map application allowing construction, the County will ensure that, among other things, the water needed for each proposed subdivision is confirmed as part of the County's subdivision map application process. This mitigation requirement shall be read and applied in combination with the requirements set forth in revised **Mitigation Measure 4.11-6**, above.	Applicant	Preparation of supplemental or subsequent EIR	1. LACDRP 2. LACDRP 3. Concurrent with Approval of Application for Tentative Tract Maps which permit construction.
4.11-18. The storage capacity purchased in the Semitropic Groundwater Banking Project by the Newhall Ranch Specific Plan applicant shall be used in conjunction with the provision of water to the Newhall Ranch Specific Plan. The applicant, or entity responsible for storing Newhall Ranch water in this groundwater bank, shall prepare an annual status report indicating the amount of water placed in storage in the groundwater bank. This report shall be made available annually and used by Los Angeles County in its decision-making processes relating to build-out of the Newhall Ranch Specific Plan.	Applicant	Receipt of written report from applicant or entity storing Newhall Ranch water	1. LACDRP 2. LACDRP 3. Concurrent with Submittal of Application for Tentative Tract Maps which permit construction.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.11 WATER RESOURCES (cont.)			
4.11-19. A Memorandum of Understanding (MOU) and Water Resource Monitoring Program has been entered into between United Water Conservation District and the Upper Basin Water Purveyors, effective August 20, 2001.[5] The MOU/Water Resource Monitoring Program, when executed, will put in place a joint water resource monitoring program that will be an effective regional water management tool for both the Upper and Lower Santa Clara River areas as further information is developed, consistent with the MOU. This monitoring program will result in a database addressing water usage in the Saugus and Alluvium aquifers over various representative water cycles. The parties to the MOU intend to utilize this database to further identify surface water and groundwater impacts on the Santa Clara River Valley. The applicant, or its designee, shall cooperate in good faith with the continuing efforts to implement the MOU and Water Resource Monitoring Program. As part of the MOU process, the United Water Conservation District and the applicant have also entered into a "Settlement and Mutual Release" agreement, which is intended to continue to develop data as part of an on-going process for providing information about surface and groundwater resources in the Santa Clara River Valley. In that agreement, the County and the applicant have agreed to the following: "4.3 Los Angeles County and Newhall will each in good faith cooperate with the parties to the MOU and will assist them as requested in the development of the database calibrating water usage in the Saugus and Alluvium aquifers over multi-year water cycles. Such cooperation will include, but not be limited to, providing the parties to the MOU with historical well data and other data concerning surface water and groundwater in the Santa Clara River and, in the case of Newhall, providing Valencia Water Company with access to wells for the collection of well data for the MOU.	Applicant	Review of Initial Study and subdivision maps	1. LACDRP 2. LACDRP 3. Concurrent with Submittal of Application for Tentative Tract Maps which permit construction.

[5] *See*, **Appendix F** to Final Additional Analysis [Memorandum of Understanding Between the Santa Clara River Valley Upper Basin Water Purveyors and United Water Conservation District, dated August 2001].

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.11 WATER RESOURCES (cont.)			
4.11-19. (cont.) 4.4 Los Angeles County and Newhall further agree that the County of Los Angeles will be provided with, and consider, the then-existing data produced by the MOU's monitoring program in connection with, and prior to, all future Newhall Ranch subdivision approvals or any other future land use entitlements implementing the Newhall Ranch Specific Plan. If the then-existing data produced by the MOU's monitoring program identifies significant impacts to surface water or groundwater resources in the Santa Clara River Valley, Los Angeles County will identify those impacts and adopt feasible mitigation measures in accordance with the California Environmental Quality Act."	Applicant	Review of Initial Study and subdivision maps	1. LACDRP 2. LACDRP 3. Concurrent with Submittal of Application for Tentative Tract Maps which permit construction.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.11 WATER RESOURCES (cont.)			
4.11-20. The Specific Plan applicant, or its successors, shall assign its acquired Nickel Water rights to the Valencia Water Company or Castaic Lake Water Agency (CLWA), and, in consultation with the Valencia Water Company, CLWA or their designee(s), the applicant shall ensure that the Nickel Water is delivered to the appropriate place of use necessary to serve the Newhall Ranch Specific Plan at the time of need, as determined by the County of Los Angeles through required SB221 and/or SB610 analyses for future subdivision map applications. Upon approval of the Specific Plan, the applicant, Valencia Water Company, CLWA or a designee, will take delivery of the Nickel Water, so that such water will be used, or stored for use, for the Specific Plan in future years. To ensure that an adequate supply of water is available for the Specific Plan over the long-term, the decision of whether or not the Nickel Water agreement should be extended or otherwise canceled cannot occur without first obtaining CLWA's concurrence. If the applicant, or its designee, seeks to not extend the Nickel Water agreement beyond its initial 35-year term, or seeks to cancel said agreement prior to the expiration of its initial 35-year period, or the expiration of the 35-year option period, if exercised, then the applicant, or its designee, must obtain written concurrence and that concurrence must include findings to the effect that other equivalent water supplies are available at a comparable cost and that non-extension or cancellation of the agreement will not impact the water supplies of Newhall Ranch and the rest of the Santa Clarita Valley.	Applicant	Verify during review of Initial Study and subdivision maps	1. LACDRP 2. LACDRP 3. Concurrent with Submittal of Application for Tentative Tract Maps which permit construction.
4.11-21. The applicant, in coordination with RWQCB staff, shall select a representative location upstream and downstream of the Newhall Ranch Specific Plan and sample surface and groundwater quality. Sampling from these two locations would begin upon approval of the first subdivision map and be provided annually to the RWQCB and County for the purpose of monitoring water quality impacts of the Specific Plan over time. If the sampling data results in the identification of significant new or additional water quality impacts resulting from the Specific Plan, which were not previously known or identified, additional mitigation shall be required at the subdivision map level.	Applicant	Water quality sampling in coordination with RWQCB staff	1. LACDRP 2. LACDRP/RWQCB 3. Concurrent with Approval of the first Subdivision Map which permits construction, and annually thereafter.
4.11-22. Beginning with the filing of the first subdivision map allowing construction on the Specific Plan site and with the filing of each subsequent subdivision map allowing construction, the Specific Plan applicant, or its designee, shall provide documentation to the County of Los Angeles identifying the specific portion(s) of irrigated farmland in the County of Los Angeles proposed to be retired from irrigated production to make agricultural water available to serve the subdivision. As a condition of subdivision approval, the applicant or its designee, shall provide proof to the County that the agricultural land has been retired prior to issuance of building permits for the subdivision.	Applicant	Receipt of written report from applicant	1. LACDRP 2. LACDRP 3. Concurrent with Submittal of Application for Tentative Tract Maps which permit construction.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.12 WASTEWATER DISPOSAL			
4.12-1. The Specific Plan shall reserve a site of sufficient size to accommodate a water reclamation plant to serve the Newhall Ranch Specific Plan.	Applicant	Specific Plan Review	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Final Approval of Specific Plan
4.12-2. A 5.8 to 6.9 mgd water reclamation plant shall be constructed on the Specific Plan site, pursuant to County, State and Federal design standards, to serve the Newhall Ranch Specific Plan.	WRP Applicant	Review of WRP Construction Plans	1. CSDLAC 2. CSDLAC 3. Prior to Demand for First Phase or WRP Capacity
4.12-3. The Conceptual Backbone Sewer Plan shall be implemented pursuant to County, State and Federal design standards.	Applicant (Project Engineer)	Review of Tentative Map	1. LACDPW 2. LACDPW 3. Prior to Approval of Tentative Maps
4.12-4. Prior to recordation of each subdivision permitting construction, the applicant of each subdivision shall obtain a letter from the new County sanitation district stating that treatment capacity will be adequate for that subdivision.	Applicant	Review Final Subdivision Map	1. CSDLAC 2. LACDPW 3. Prior to Recordation of Each Final Subdivision Map
4.12-5. All facilities of the sanitary sewer system will be designed and constructed for maintenance by the County of Los Angeles Department of Public Works and the County Sanitation Districts of Los Angeles County, and/or the new County sanitation district or similar entity in accordance with their manuals, criteria, and requirements.	Applicant (Project Engineer)	Review Final Subdivision Plans	1. CSDLAC, LACDPW 2. CSDLAC, LACDPW 3. Prior to Recordation of Each Final Subdivision Map
4.12-6. Pursuant to Los Angeles County Code, Title 20, Division 2, all industrial waste pretreatment facilities shall, prior to the issuance of building permits, be reviewed by the County of Los Angeles Department of Public Works, Industrial Waste Planning and Control Section and/or the new County sanitation district, to determine if they would be subject to an Industrial Wastewater Disposal Permit.	Applicants for Such Industrial Facilities	Plan Check Review	1. LACDPW 2. LACDPW 3. Prior to Issuance of Building Permits
4.12-7. Each subdivision permitting construction shall be required to be annexed into the Los Angeles County Consolidated Sewer Maintenance District.	LACDPW	Review of Final Sewer Plans	1. LACDPW 2. LACDPW 3. After County Acceptance of Sewer Improvements

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.13 NATURAL GAS			
4.13-1. All development within the Specific Plan area shall comply with the Energy Building Regulations adopted by the California Energy Commission (Title 24 of the California Administrative Code), as applicable.	Applicant/Future Owners and Operators within project	Plan Check Field Verification	1. LACDPW, Building and Safety 2. LACDPW, Building and Safety 3. Prior to Issuance of Occupancy Permit(s)
4.13-2. A letter from Southern California Gas Company (SCGC)or other gas provider is to be obtained prior to recordation of all future subdivisions stating that service can be provided to the subdivision under recordation.	Applicant	Receipt of Letter from Gas Provider	1. LACDRP 2. LACDRP 3. Prior to Recordation of Final Maps
4.13-3. The Specific Plan is to meet the requirements of SCGC in terms of pipeline relocation, grading in the vicinity of gas mains, and development within SCGC easements. These requirements would be explicitly defined by SCGC at the future tentative map stage.	Applicant (Construction Contractor)	Receipt and implementation of Such Requirements from SCGC	1. LACDPW, Building and Safety 2. LACDPW, Building and Safety 3. Grading and Construction Operations
4.13-4. All potential buyers or tenants of property in the vicinity of SCGC transmission lines are to be made aware of the line's presence in order to assure that no permanent construction or grading occurs over and within the vicinity of the high-pressure gas mains.	Applicant	Include in Sale/Lease Disclosure Documents	1. LACDRP 2. LACDRP 3. Prior to Issuance of Occupancy Permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.14 ELECTRICITY			
4.14-1. All development within the Specific Plan area shall comply with the Energy Building Regulations adopted by the California Energy Commission (Title 24 of the California Administrative Code), as applicable.	Applicant	Plan Check Field Verification	1. LACDPW, Building and Safety 2. LACDPW, Building and Safety 3. Prior to Issuance of Occupancy Permit(s)
4.14-2. Southern California Edison (SCE)or other energy provider is to be notified of the nature and extent of future development on the Specific Plan site prior to recordation of all future subdivisions.	Applicant	Receipt of Notification to Energy Provider	1. LACDRP 2. LACDRP 3. Prior to Recordation of All Subdivisions
4.14-3. All future tract maps are to comply with SCE or other energy provider guidelines for grading, construction, and development within SCE easements.	Applicant (Construction Contractor)	Plan Check Field Verification	1. LACDPW, Building and Safety 2. LACDPW, Building and Safety 3. Prior to Final Tract Map Approvals and Verify Prior to Issuance of Occupancy Permits
4.14-4. Electrical infrastructure removals and relocations are to be coordinated between the Specific Plan engineer and SCE or other energy provider as each tract is designed and constructed.	Applicant (Specific Plan Engineer)	Receipt of Verification of Such Consultations	1. LACDPW 2. LACDPW 3. Prior to Final Tract Map Approval and During Construction
4.14-5. All future tract maps are to be reviewed by Los Angeles County to ensure adequate accessibility to SCE or other energy provider facilities as a condition of their approvals.	Applicant	Plan Check	1. LACDPW 2. LACDPW 3. Prior to Final Tract Map Approval
4.14-6. Upon transfer of the High Country Special Management Area to another entity for long-term maintenance, continued and adequate access to all SCE facilities in the High Country Special Management Area is to be ensured within the transfer agreement.	Applicant	Review of Transfer Agreement	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Upon Transfer of High Country SMA

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.15 SOLID WASTE DISPOSAL			
4.15-1. Each future subdivision which allows construction within the Newhall Ranch Specific Plan shall meet the requirements of all applicable solid waste diversion, storage, and disposal regulations that are in effect at the time of subdivision review. Current applicable regulations include recycling areas that are: • compatible with nearby structures; • secured and protected against adverse environmental conditions; • clearly marked, and adequate in capacity, number and distribution; • in conformance with local building code requirements for garbage collection access and clearance; • designed, placed and maintained to protect adjacent developments and transportation corridors from adverse impacts, such as noise, odors, vectors, or glare; • in compliance with Federal, State, or local laws relating to fire, building, access, transportation, circulation, or safety; and • convenient for persons who deposit, collect, and load the materials.	Applicant	Include in Future Subdivision Design and/or environmental documents for Tentative Maps	1. LACDPW, Waste Management Division 2. LACDPW, Waste Management Division 3. Prior to Tentative Map Approval
4.15-2. Future multi-family, commercial, and industrial projects within the Specific Plan shall provide accessible and convenient areas for collecting and loading recyclable materials. These areas are to be clearly marked and adequate in capacity, number, and distribution to serve the development.	Applicant	Include in Future Subdivision Design and/or environmental documents for Tentative Maps	1. LACDPW, Waste Management Division 2. LACDPW, Waste Management Division 3. Prior to Tentative Map Approval
4.15-3. The first purchaser of each residential unit within the Specific Plan shall be given educational or instructional materials which will describe what constitutes recyclable and hazardous materials, how to separate recyclable and hazardous materials, how to avoid the use of hazardous materials, and what procedures exist to collect such materials.	Applicant	Review of Information Package and Distribution Records	1. LACDRP 2. LACDRP 3. Prior to Issuance of Building Permit (Package) and Occupancy Permits (Records)
4.15-4. The applicant of all subdivision maps which allow construction within the Specific Plan shall comply with all applicable future State and Los Angeles County regulations and procedures for the use, collection and disposal of solid and hazardous wastes.	Applicant	Include in Future Subdivision Design and/or environmental documents for Tentative Maps	1. LACDPW, Waste Management Division 2. LACDPW, Waste Management Division 3. Prior to Tentative Map Approval

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.16 EDUCATION			
4.16-1. The Specific Plan developer shall reserve five elementary schools sites, one junior high school site and one high school site, of 7 to 10, 20 to 25, and 40 to 45 acres in size, respectively, depending upon adjacency to local public parks and joint use agreements.	Applicant	Tentative Tract Map Subdivision Review	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Prior to Final Approval of Tentative Tract Maps
4.16-2. The developer of future subdivisions which allow construction will comply with the terms and conditions of the School Facilities Funding Agreement between The Newhall Land and Farming Company and the Newhall School District.	Applicant	Verification of Compliance from School District	1. Newhall School District 2. LACDPW, Building and Safety 3. Prior to Issuance of Residential Building Permits
4.16-3. The developer of future subdivisions which allow construction will comply with the terms and conditions of the School Facilities Funding Agreement between The Newhall Land and Farming Company and the William S. Hart Union High School District.	Applicant	Verification of Compliance from School District	1. WSHUHSD 2. LACDPW, Building and Safety 3. Prior to Issuance of Residential Building Permits
4.16-4. The developer of future subdivisions which allow construction will comply with the terms and conditions of the School Facilities Funding Agreement between The Newhall Land & Farming Company and the Castaic Union School District.	Applicant	Verification of Compliance from School District	1. Castaic Union School District 2. LACDPW, Building and Safety 3. Prior to Issuance of Residential Building Permits
4.16-5. In the event that School District boundaries on the Specific Plan site remain unchanged, prior to recordation of all subdivision maps which allow construction, the developer of future subdivisions which allow construction is to pay to the Castaic Union School District the statutory school fee for commercial/industrial square footage pursuant to Government Code Sections 65995 and 65996, unless a separate agreement to the contrary is reached with the District.	Applicant	Payment of Fees	1. Castaic Union School District 2. LACDPW, Building and Safety 3. Prior to Issuance of Building Permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.17 POLICE SERVICES			
4.17-1. As subdivision maps are submitted to the County for approval in the future, the applicant shall incorporate County Sheriff's Department design requirements (such as those pertaining to site access, site security lighting, etc.) which will reduce demands for Sheriff's service to the subdivisions and which will help ensure adequate public safety features within the tract designs.	Applicant	Plan Check Field Verification	1. LA County Sheriff's Department 2. LA County Sheriff's Department 3. Prior to Final Map Approvals and Verify Prior to Issuance of Occupancy Permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.18 FIRE SERVICES AND HAZARDS			
4.18-1. At the time of final subdivision maps permitting construction in development areas that are adjacent to Open Area and the High Country SMA, a Wildfire Fuel Modification Plan shall be prepared and submitted for approval by the County Fire Department. The Wildfire Fuel Modification Plan shall include the following construction period requirements: (a) a fire watch during welding operations; (b) spark arresters on all equipment or vehicles operating in a high fire hazard area; (c) designated smoking and non-smoking areas; and (d) water availability pursuant to County Fire Department requirements. The wildfire fuel modification plan shall depict a fuel modification zone in conformance with the Fuel Modification Ordinance in effect at the time of subdivision. Within the zone, tree pruning, removal of dead plant material and weed and grass cutting shall take place as required by the County Forester. Fire resistant plant species containing habitat value may be planted in the fuel modification zone.	Applicant	Receipt and Review of Wildfire Fuel Modification Plan	1. LA County Fire Department 2. LA County Fire Department 3. Prior to Approval of Final Maps
4.18-2. Each subdivision and site plan for the proposed Specific Plan shall provide sufficient capacity for fire flows of 1,250 gallons per minute (gpm) at 20 pounds per square inch (psi) residual pressure for a two hour duration for single family residential units, and 5,000 gpm at 20 psi residual pressure for a five-hour duration for multi-family residential units and commercial/retail uses, or whatever fire flow requirement is in effect at the time of subdivision and site plan approval.	Applicant	Field Verification of Required Fire Flows	1. LA County Fire Department 2. LA County Fire Department 3. Prior to Issuance of Occupancy Permits
4.18-3. Each subdivision map and site plan for the proposed Specific Plan shall comply with all applicable building and fire codes and hazard reduction programs for Fire Zones 3 and 4 that are in effect at the time of subdivision map and site plan approval.	Applicant	Field Verification	1. LA County Fire Department 2. LA County Fire Department 3. Prior to Issuance of Occupancy Permits

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.18 FIRE SERVICES AND HAZARDS (cont.)			
4.18-4. The developer will provide funding for three fire stations to the Consolidated Fire Protection District of Los Angeles County (the "Fire District") in lieu of developer fees. The developer will dedicate two fire station sites for the two fire stations located in Newhall Ranch. The Fire District will dedicate the site for the fire station to be located at the Del Valle Training Facility. Each fire station site will have a building pad consisting of a net buildable area of one acre. If the cost of constructing the three fire stations, providing and dedicating the two fire station sites, and providing 3-engines, 1 paramedic squad and 63 percent of a truck company exceeds the developer's developer fee obligation for the Newhall Ranch development as determined by the Fire District, the Fire District will fund the costs in excess of the fee obligation. Two of the three fire stations to be funded by the developer will not exceed 6,000 square feet; the third fire station to be funded by the developer will not exceed 8,500 square feet. The Fire District, will fund the cost of any space/square footage of improvement in excess of these amounts as well as the cost of the necessary fire apparatus for any such excess square footage of improvements. The cost of three fire engines, a proportionate share of a truck and one squad to be provided by the developer will be determined based upon the apparatus cost at the time the apparatus is placed in service. The Fire District and the developer will mutually agree to the requirements of first-phase protection requirements based upon projected response/travel coverage. Such mutual agreement regarding first-phase fire protection requirements ("fire protection plan") and the criteria for timing the development of each of the three fire stations will be defined in a Memorandum of Understanding between the developer and the Fire District. Delivery of fire service for Newhall Ranch will be either from existing fire stations or one of the three fire stations to be provided by the developer pursuant to this section. Prior to the commencement of the operation of any of the three fire stations, fire service may be delivered to Newhall Ranch from existing fire stations or from temporary fire stations to be provided by the developer at mutually agreed-upon locations, to be replaced by the permanent stations which will be located within the Newhall Ranch development. The developer and the Fire District will annually review the fire protection plan to evaluate development and market conditions and modify the Memorandum of Understanding accordingly.	Applicant	Execute "Fire Protection Plan" Agreement Monitor Adequacy of Fire Prevention Services	1. LA County Fire Department 2. LA County Fire Department 3. Prior to Approval of First Final Subdivision Map Subdivision Map Review Process

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.19 LIBRARIES			
4.19-1. The developer will provide funding for a maximum of two libraries (including the site(s), construction, furniture, fixtures, equipment and materials) to the County Librarian. The developer will dedicate a maximum of two library sites for a maximum of two libraries located in Newhall Ranch in lieu of the land component of the County's library facilities mitigation fee, in accordance with the provisions of Section 22.72.090 of Section 2 of Ordinance No. 98-0068. The actual net buildable library site area required and provided by the developer will be determined by the actual size of the library building(s), the Specific Plan parking requirements, the County Building Code, and other applicable rules. The total library building square footage to be funded by the developer will not exceed 0.35 net square feet per person. The developer's funding of construction of the library(s) and furnishings, fixtures, equipment and materials for the library(s) will be determined based on the cost factors in the library facilities mitigation fee in effect at the time of commencement of construction of the library(s). Prior to County's issuance of the first residential building permit of Newhall Ranch to the developer, the County Librarian and the developer will mutually agree upon the library construction requirements (location, size, funding and time of construction) based upon the projected development schedule and the population of Newhall Ranch based on the applicable number of average persons per household included in the library facilities mitigation fee in effect at the time. Such mutual agreement regarding the library construction requirements ("Library Construction Plan") and the criteria for timing the completion of the library(s) will be defined in a Memorandum of Understanding between the developer and the County Librarian. Such Memorandum of Understanding shall include an agreement by the developer to dedicate sufficient land and pay the agreed amount of fees on a schedule to allow completion of the library(s) as described below. The developer's funding for library facilities shall not exceed the developer's fee obligation at the time of construction under the developer fee schedule.	Applicant	Review of Memorandum of Understanding and Library Construction Plan	1. LA County Library 2. LACDPW 3. Prior to Issuance of First Residential Building Permit
4.19 LIBRARIES (cont.)			
If two libraries are to be constructed, the first library will be completed and operational by the time of County's issuance of the 8,000th residential building permit of Newhall Ranch, and the second library will be completed and operational by the time of County's issuance of the 15,000th residential building permit of Newhall Ranch. If the County Librarian decides that only one library will be constructed, the library will be completed and operational by the time of County's issuance of the 10,000th residential building permit of Newhall Ranch.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
No payment of any sort with respect to library facilities will be required under Section 2.5.3.d. of the Specific Plan in order for the developer to obtain building permits for nonresidential buildings.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
4.20 PARKS, RECREATION AND TRAILS			
4.20-1. Development of the Newhall Ranch Specific Plan will provide the following acreages of parks and Open Area: • Ten public Neighborhood Parks totaling 55 acres; • Open Areas totaling 1,106 acres of which 186 acres are Community Parks, • High Country Special Management Area of 4,214 acres, • River Corridor Special Management Area of 819 acres, • a 15-acre Lake, • an 18-hole Golf Course, and • a trail system consisting of: - Regional River Trail, - Community Trails, and - Unimproved Trails.	Applicant	Subdivision Review for Compliance with Specific Plan	1. LA County Department of Regional Planning 2. LA County Department of Regional Planning 3. Processing of Tentative Subdivision Maps
4.20-2. Prior to the construction of the proposed trail system, the project applicant shall finalize the alignment of trails with the County Department of Parks and Recreation.	Applicant	Verification of Consultation of Department of Parks and Recreation	1. LACDRP 2. LA County Department of Parks and Recreation 3. Prior to Issuance of Grading Permit for Trails
4.20-3. Trail construction shall be in accordance with the County of Los Angeles Department of Parks and Recreation trail system standards.	Applicant	Trails Plan Review Field Verification	1. LA County Department of Parks and Recreation 2. LA County Department of Parks and Recreation 3. Prior to Approval of Trail Plans and Verify Upon Construction Completion
4.21 POPULATION, HOUSING AND EMPLOYMENT			
4.21-1. The Los Angeles County General Plan and the Santa Clarita Valley Area Plan shall be amended by Los Angeles County to accommodate the Newhall Ranch Specific Plan.	Applicant	General Plan Amendment	1. Board of Supervisors 2. LACDRP 3. Final Specific Plan Approval

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
ADDITIONAL CONDITIONS OF APPROVAL			
(a) Require the applicant to submit a signed statement, filed concurrently with the filing of any departmental development application, obligating the applicant to disclose to the Department of Regional Planning the existence of any endangered or threatened species that are known or suspected to exist on the subject property.	Applicant	Verify during review of Initial Study and subdivision maps	1. LACDRP 2. LACDRP 3. Concurrent with Submittal of Application for Tentative Tract Maps which permit construction.
(b) Require the applicant to report to the Department of Regional Planning the results of all on-site biological surveys within thirty (30) days after completion of the survey work.	Applicant	Report containing results of all on-site biological surveys within thirty (30) days after completion of the survey work.	1. LACDRP 2. LACDRP 3. As necessary
(c) Require the applicant to schedule a consultation meeting between the Department of Regional Planning, the applicant and environmental consultant(s) to discuss the results of the survey work, and to ensure public disclosure of the survey results in the required environmental documentation for the proposed project.	Applicant and Environmental Consultant(s)	Meeting after field surveys	1. LACDRP 2. LACDRP 3. As necessary
(d) Clean sediment, periodically removed from debris basins within or outside the Specific Plan, may be placed into the Santa Clara River area as approved by the Department of Public Works (DPW) and other applicable regulatory agencies, as determined by DPW.	Applicant	Verify need annually, document to LACDPW	1. LACDPW 2. LACDPW 3. As necessary after installation of buried bank stabilization
(e) Prior to approval of the first subdivision map which permits construction, a report will be provided by the applicant which evaluates methods to recharge the Saugus Aquifer within the Specific Plan, including the identification of appropriate candidate land areas for recharge. The report shall be subject to approval by the Department of Public Works (DPW) and other applicable regulatory agencies, as determined by DPW.	Applicant	Report to LADPW	1. LACDPW 2. LACDPW 3. Prior to approval of the first subdivision map which permits construction

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
ADDITIONAL CONDITIONS OF APPROVAL (cont.)			
(f) All purchasers of homes within any subdivision in the Newhall Ranch Specific Plan are to be provided with a disclosure statement in the purchase/sales documentation making the purchaser(s) aware that the parking and storage of recreational vehicles on the purchased home/lot must satisfy the standards established by the County of Los Angeles and/or as contained in the Conditions Covenants and Restrictions (CC&Rs), whichever is more restrictive.	Applicant, or seller of home/lot if not the Applicant	Provision of Disclosure Statement	1. LACDRP 2. LACDRP 3. At the time a home/lot is sold
(g) Salt Creek Condition. Upon approval of the first tract map adjacent to Ventura County in the Oak Valley Village of the Newhall Ranch Specific Plan, the applicant has agreed to grant to the public in perpetuity the approximately 1,517 acres of land encompassing the Salt Creek watershed in Ventura County. The applicant, or its designee, shall satisfy this condition by dedicating said land in fee and/or by conservation easement, as determined by the County in its sole discretion, to the joint powers authority, which is responsible for overall recreation and conservation of the Newhall Ranch High County Special Management Area (SMA). Said land shall be managed in conjunction with and in the same manner as the High Country SMA.	Applicant or its Designee	Upon approval of first tract map adjacent to Ventura County in Oak Valley Village of the Specific Plan	1. LACDRP 2. LACDRP 3. As necessary
(h) Consultant Disclosure Statements. Upon approval of the Specific Plan and in connection with the submittal of additional environmental documentation for the Newhall Ranch project, each consultant preparing, or participating in a study or investigation for, that additional documentation, shall provide a disclosure statement to the Director of Planning, signed under penalty of perjury, stating that they have disclosed to County staff all relevant environmental information and data obtained during their work, including, but not limited to, all information regarding the presence of any endangered, threatened or candidate species.	Applicant or its Designee	Upon approval of Specific Plan and in connection with submittal of additional environmental documentation for the project	1. LACDRP 2. LACDRP 3. As necessary
(i) Peer Review/Funding. Upon approval of the Specific Plan, the applicant is directed to provide sufficient funding on an annual basis to allow the Department of Regional Planning to retain a consultant(s), or to compensate its own consultant(s), for purposes of conducting a peer review, as determined necessary by the Department, of all additional environmental documentation submitted for further environmental review by the applicant's consultant(s) or sub-consultant(s).	Applicant or its Designee	Upon approval of Specific Plan and on an annual basis thereafter	1. LACDRP 2. LACDRP 3. As necessary

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
(j) Annual Staff Report Requirement. The applicant or its designee shall provide the Department of Regional Planning with an annual status report throughout the construction phases stating the number of residential units constructed, the square footage of all commercial and industrial buildings completed, the dates of dedication or completion for all required infrastructure and community amenities, the status of all tentative and approved subdivision maps and discretionary zoning applications, including associated CEQA environmental reviews filed with the County, and the status of all discretionary applications from government agencies other than Los Angeles County identified as either an Enforcement Agency or Monitoring Agency in the Mitigation Monitoring Plan for the Newhall Ranch Specific Plan. This reporting requirement shall be contained in the Newhall Ranch Specific Plan.	Applicant or its Designee	Annual report throughout all construction phases	1. LACDRP 2. LACDRP 3. As necessary
(k) Setback Standards. The Specific Plan shall contain a setback provisions requiring that, if the County's general setback standards in place at the time building permits are obtained for the Newhall Ranch project phases are more stringent than the existing standards contained in the Specific Plan, then the more stringent setback standards shall be applied.	Applicant or its Designee	County Planning staff review at issuance of building permits	1. LACDRP 2. LACDRP 3. As necessary

MITIGATION MONITORING PLAN (Water Reclamation Plant)

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.1 GEOTECHNICAL AND SOILS RESOURCES			
5.0-1. Prior to construction of the water reclamation plant, prepare a detailed geotechnical report that will outline the geotechnical performance requirements for placing and compacting the fill at the water reclamation plant site and along on-site sewer line alignments to ensure that none of the wastewater conveyance or treatment facilities would be subject to hazards caused by expansive soils. Construction of wastewater conveyance and treatment facilities shall comply with the requirements identified in the report.	WRP Operator (Geotechnical Engineer)	Grading Plan Check Field Verification	1. WRP Operator 2. WRP Operator 3. Prior to Building and Verify During WRP Construction
5.0-2. Should any expansive soils be encountered during grading operations, they shall not be placed nearer the finished surface than 8 feet below the bottom of the subgrade elevation. If expansive materials are encountered at subgrade elevation in cut areas, the soils shall be removed to a depth of 8 feet below the subgrade surface and the excavated area backfilled with nonexpansive, properly compacted soils. These depths are subject to revision depending upon the expansive potential measured during grading.	WRP Operator (Geotechnical Engineer)	Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations
5.0-3. Prior to grading of the WRP site and the associated sewer lines, a detailed geotechnical performance report is to be prepared and approved by the WRP Operator, which will assess liquefaction potential along sewer line alignments, and which will identify design measures for potential liquefaction hazards. WRP collection and treatment facilities construction is to comply with the measures identified in the performance report.	WRP Operator (Geotechnical Engineer)	Approval of Detailed Geotechnical Performance Report Field Verification	1. WRP Operator 2. WRP Operator 3. Prior to Grading and Verify During WRP Construction

ACOE - U.S. Army Corps of Engineers
CIWMB - California Integrated Waste Management Board
CSDLAC - County Sanitation Districts of Los Angeles County
FCD - Flood Control Division
LACFPD - Los Angeles County Fire Protection District
LACDPW - Los Angeles County Department of Public Works
RWQCBLAR - Regional Water Quality Control Board, Los Angeles Region
SCAQMD - South Coast Air Quality Management District
USFWS - U.S. Fish and Wildlife Service

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.1 GEOTECHNICAL AND SOILS RESOURCES (cont.)			
5.0-4. All water reclamation plant structures and facilities are to be constructed according to Uniform Building Code standards for the appropriate Seismic Risk Zone (Zone 4).	WRP Operator (Structural Engineer)	Plan Check Field Verification	1. WRP Operator 2. WRP Operator 3. Prior to Initial Operation
5.0-5. If the height of the fill exceeds the shear strength of such saturated soils, settlement and ground failure could occur, resulting in damage to structures and/or injury to people. Potentially consolidatible materials are to be properly removed and the fill material is to be properly compacted and protected against the erosive effects of storm and River flows.	WRP Operator (Geotechnical Engineer)	Grading Plan Check Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations
5.0-6. All fills, unless otherwise specifically designed, are to be compacted to at least 90 percent of the maximum dry unit weight as determined by ASTM Designation D 1557-91 Method of Soil Compaction. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	WRP Operator (Geotechnical Engineer)	Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations
5.0-7. No fill is to be placed until the area to receive the fill has been adequately prepared and approved by the Geotechnical Engineer. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	WRP Operator (Geotechnical Engineer)	Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations
5.0-8. Fill soils are to be kept free of all debris and organic material. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	WRP Operator (Geotechnical Engineer)	Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.1 GEOTECHNICAL AND SOILS RESOURCES (cont.)			
5.0-9. Rocks or hard fragments larger than 8 inches are not to be placed in the fill without approval of the Geotechnical Engineer, and in a manner specified for each occurrence. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	WRP Operator (Geotechnical Engineer)	Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations
5.0-10. Rock fragments larger than 8 inches are not to be placed within 10 feet of finished pad grade or the subgrade of roadways or within 15 feet of a slope face. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	WRP Operator (Geotechnical Engineer)	Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations
5.0-11. When moisture content of the fill material is too low to obtain adequate compaction, water is to be added and thoroughly dispersed until the soil is approximately 2 percent over optimum moisture content. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	WRP Operator (Geotechnical Engineer)	Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations
5.0-12. When the moisture content of the fill material is too high to obtain adequate compaction, the fill material is to be aerated by blading or other satisfactory methods until the soil is approximately two percent over optimum moisture content. (R.T. Frankian & Associates, 19 September 1994, Appendix I)	WRP Operator (Geotechnical Engineer)	Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations
5.0-13. Surface runoff from the future graded areas is not to run over any natural, cut, or fill slopes. (Allan E. Seward Engineering Geology, 19 September 1994, Inc., p. 20)	WRP Operator (Civil Engineer and Construction Superintendent)	Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.2 FLOOD			
5.0-14. Runoff from future pads and structures is to be collected and channeled to the street and/or natural drainage courses via non-erosive drainage devices. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 20)	WRP Operator (Civil Engineer and Construction Superintendent)	Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations
5.0-15. Water is not to stand or pond anywhere on the graded pads. (Allan E. Seward Engineering Geology, Inc., 19 September 1994, p. 20)	WRP Operator (Civil Engineer and Construction Superintendent)	Field Verification	1. WRP Operator 2. WRP Operator 3. During Grading Operations
5.0-16. Prepare and implement a County-approved erosion control plan to be implemented during the construction of the WRP.	WRP Operator (Civil Engineer)	Approval of Erosion Control Plan Field Verification	1. WRP Operator 2. WRP Operator 3. Prior to Grading and Verify During Grading Operations
5.0-17. All on- and off-site flood control improvements necessary to alleviate flood hazards and provide proper drainage controls are to be constructed to the satisfaction of the County of Los Angeles Department of Public Works, FCD.	WRP Operator (Civil Engineer)	Field Verification	1. LACDPW, FCD 2. WRP Operator 3. Prior to Issuance of Occupancy Permits
5.0-18. All necessary permits or letters of exemption from the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, California Department of Fish and Game, and the Regional Water Quality Control Board for WRP-related development are to be obtained.	WRP Applicant	Receipt of Permits	1. ACOE, CDFG, and RWQCBLAR 2. WRP Applicant 3. Prior to Grading
5.0-19. Conditional Letters of Map Revision (CLOMR) relative to adjustments to the 100-year FIA flood plain are to be obtained by the applicant after the proposed drainage facilities are constructed.	WRP Operator (Civil Engineer)	Receipt of CLOMR	1. LACDPW, FCD 2. WRP Operator 3. Upon Completion of Facilities
5.0-20. Prior to grading, a Final Hydrology Plan, a Final Drainage Plan, and a Final Grading Plan (including an Erosion Control Plan, as required) are to be prepared by the applicant and approved by the Department of Public Works, where applicable, to ensure that no significant erosion, sedimentation, or flooding impacts would occur during or after site development.	WRP Applicant (Civil Engineer)	Approval of Final Hydrology Plan, Final Drainage Plan, Final Grading Plan	1. LACDPW 2. FCD 3. Prior to Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.3 CULTURAL/PALEONTOLOGICAL RESOURCES			
5.0-21. No significant impact to cultural or paleontological resources are anticipated from construction of the WRP. However, should such resources be found during site grading, a professional archaeologist or paleontologist will be retained to evaluate the significance of the finding and to identify appropriate methods of preserving or cataloguing any significant resources.	WRP Operator (Archaeologist and/or Paleontologist)	Include Measure in WRP Specifications Field Verification	1. LA County Department of Regional Planning 2. WRP Operator 3. Verify During Grading Operations
5.4 AGRICULTURAL RESOURCES			
No mitigation measures are available that could reduce the impact of conversion of prime agricultural land to an urban use to less than significant.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.5 ENVIRONMENTAL SAFETY			
5.0-22. Design and operate the WRP in accordance with an NPDES Permit that must be obtained from the California Regional Water Quality Control Board, Los Angeles Region.	WRP Operator	Approval of WRP Design and Operation Plans by RWQCBLAR Field Verification	1. RWQCBLAR 2. WRP Operator 3. Prior to Issuance of Construction Permits and Verify During WRP Operation
5.0-23. Prepare and implement worker safety programs in accordance with Cal-OSHA requirements.	WRP Operator	Review of Worker Safety Program Field Verification	1. Cal-OSHA 2. WRP Operator 3. Prior to and During WRP Operation
5.0-24. Prepare and implement preventive and contingency plans for controlling accidental discharges of wastewater or chemicals used and stored at the WRP, and for minimizing the effects of such events. Such plans shall be integrated into the CSDLAC's overall preventive (fail-safe) and contingency (emergency response) plans and programs.	WRP Operator	Approval of Plans Field Verification	1. Los Angeles Co. Fire Department 2. WRP Operator 3. Prior to and During WRP Operation
5.0-25. A Stormwater Pollution Prevention Plan (SWPPP) shall be prepared and implemented, in accordance with the U.S. Environmental Protection Agency's Industrial Stormwater Permit.	WRP Operator	Review of SWPPP Field Verification	1. RWQCBLAR 2. WRP Operator 3. Prior to and During WRP Operation

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.5 ENVIRONMENTAL SAFETY (cont.)			
5.0-26. Any industrial wastewater that may be produced from manufacturing, commercial processing operations, acute care medical facilities and laboratories, etc., that would be allowed in the Commercial, Mixed-Use or Business Park land use designations as regulated by the Specific Plan, shall comply with the Wastewater Ordinance of the County Sanitation Districts of Los Angeles County (April 1, 1972, as amended November 1, 1989). A permit from the CSDLAC would be required for any such facility to allow discharge into the Newhall Ranch sewer system.	Business Owners in Commercial, Mixed Use, or Business Park Land Use Designations	Review of Building Plans	1. WRP Operator 2. WRP Operator 3. Prior to Issuance of Building Permit
5.0-27. Prepare and implement an "Integrated Emergency Response Plan" (IERP). The IERP provides procedures for personnel medical emergencies, evacuation procedures and mitigation and abatement procedures for hazardous chemicals. The plan must conform to multiple regulatory requirements, including Title 8 §3220, Emergency Action Plan, §3221, Fire Prevention Plan, §5192 Emergency Response to Hazardous Substances Releases, and Title 22, §66265.50-66265.56, Contingency Plan and Emergency Procedures.	WRP Operator	Review of IERP Field Verification	1. Los Angeles Co. Fire Department 2. WRP Operator 3. Prior to and During WRP Operation
5.0-28. Biosolids treatment and disposal methods shall meet California Title 22, Division 4.5, Chapter 11, Article 3, which contains Toxicity Characteristic Leaching Procedure (TCLP) and Soluble Threshold Limit Concentration (STLC) limits.	WRP Operator	Review of Construction Plans Laboratory Testing	1. RWQCBLAR 2. WRP Operator 3. Prior to and During WRP Operation
5.0-29. Obtain permits to construct and operate all new sources of air toxic emissions, at each stage of WRP development, and whenever any new sources are added or replaced, pursuant to SCAQMD Regulation XIV.	WRP Operator	Review of SCAQMD Permits	1. SCAQMD 2. WRP Operator 3. Prior to Issuance of Construction Permits and During WRP Operation

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.6 BIOTA			
5.0-30. Comply with permit requirements established by the California Department of Fish and Game, the U.S. Army Corps of Engineers, and/or the U.S. Fish and Wildlife Service, relative to removal and replacement of riparian habitat.	WRP Applicant	Obtain Required Permits Field Verification	1. CDFG, ACOE 2. WRP Operator 3. During Monitoring Period Specified in Permits
5.0-31. Obtain and implement an NPDES construction permit to avoid significant erosion or sedimentation impacts.	WRP Operator	Receipt of NPDES Permit(s) Field Verification	1. RWQCBLAR 2. WRP Operator 3. Prior to and During Grading and Construction
5.0-32. Comply with permit requirements of Federal, State and regional agencies with jurisdiction over discharge of reclaimed water to the Santa Clara River relative to potential impacts on the River's biological values.	WRP Operator	Field Verification Laboratory Testing	1. RWQCBLAR 2. WRP Operator 3. During WRP Operation

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.7 VISUAL QUALITIES			
5.0-33. To soften views of the reclamation plant from SR-126, provide vegetation, walls, fencing, and/or other appropriate techniques and combinations of techniques. Walls and fencing shall comply with the Specific Plan Design Guidelines.	WRP Operator	Field Verification	1. LA County Department of Regional Planning 2. WRP Operator 3. Prior to Operation
5.0-34. Landscaping themes shall be consistent with the themes developed for adjacent Business Park development to provide visual continuity and minimize contrast between the WRP facilities and their surroundings.	WRP Operator	Field Verification	1. LA County Department of Regional Planning 2. WRP Operator 3. Prior to Operation
5.0-35. Place, orient and shield light fixtures to illuminate only those areas where it is needed and to prevent stray light from spilling off site.	WRP Operator	Field Verification	1. LA County Department of Regional Planning 2. WRP Operator 3. Prior to Operation

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.8 TRAFFIC/ACCESS			
5.0-36. If SR-126 is still a two-lane highway at the time of WRP construction, a construction traffic management plan shall be prepared and implemented. This plan shall address site access, staging and storage areas, hours of construction, work crew parking, warning and traffic control signs and devices, flag men, temporary detouring, etc., as appropriate, to avoid a significant impact on SR-126.	WRP Operator (Construction Superintendent)	Approval of Construction Traffic Management Plan Field Verification	1. WRP Operator 2. WRP Operator 3. Prior to and During Grading and Construction Activities
5.0-37. An encroachment permit shall be obtained from Caltrans, for access to the plant site from SR-126.	WRP Applicant	Receipt of Encroachment Permit(s)	1. Caltrans 2. WRP Applicant 3. Prior to Grading
5.9 NOISE			
5.0-38. All construction activity occurring on the water reclamation plant site shall adhere to the requirements of the "County of Los Angeles Construction Equipment Noise Standards", County of Los Angeles Ordinance No. 11743.	WRP Operator	Field Verification Using Noise Monitor	1. LA County Dept. of Health Services 2. WRP Operator 3. During Grading and Construction
5.0-39. Limit all construction activities occurring near occupied residences to between the hours of 6:30 A.M. and 8:00 P.M., and exclude all Sundays and legal public holidays, pursuant to County Construction Section standards.	WRP Operator	Field Verification	1. LA County Dept. of Health Services 2. WRP Operator 3. During Grading and Construction
5.0-40. All operational activity occurring on the water reclamation plant site shall adhere to the requirements of the "County of Los Angeles Exterior Noise Standards for Stationary and Point Noise Sources," pursuant to §12.08.390 of County of Los Angeles Ordinance No. 11743.	WRP Operator	Periodic Field Verification Using Noise Monitor	1. LA County Dept. of Health Services 2. WRP Operator 3. During WRP Operation

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.10 AIR QUALITY			
CONSTRUCTION IMPACTS			
The proposed WRP would be subject to SCAQMD Rule 403, which prohibits emissions of fugitive dust from any active operation, open storage pile, or disturbed surface areas from remaining in the atmosphere beyond the property line of the emission source. The builder of the plant would be required to implement dust control measures for each fugitive dust source type, to prevent visible roadway dust from being deposited more than 50 feet from any property access road, and to remove all visible roadway dust deposited upon public paved roadways as a result of active operations at the conclusion of each work day. The following mitigation measure is recommended to implement this rule:			
5.10 AIR QUALITY (cont.)			
5.0-41. Prepare and implement a fugitive dust emission control plan which conforms to the requirements of SCAQMD Rule 403. The plan shall include the following specific measures and be submitted to the SCAQMD for review and approval: a. Apply approved non-toxic chemical soil stabilizers according to manufacturer specifications to all inactive construction areas (previously graded areas inactive for four days or more). b. Replace ground cover in disturbed areas as quickly as possible c. Enclose, cover, water twice daily, or apply approved soil binders to exposed piles (i.e., gravel, sand, dirt) according to manufacturer's specifications. d. Water active grading sites at least twice daily. e. Suspend all excavating and grading operations when wind speeds (as instantaneous gusts exceed 25 mph). f. Provide temporary wind fencing with 50 percent or less porosity along the perimeter of sites that have been cleared or are being graded. g. All trucks hauling dirt, sand, soil or other loose materials are to be covered or should maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer), in accordance with Sections 23114 of the California Vehicle Code. h. Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip. i. Sweep streets at the end of the day if visible soil material is carried over to adjacent roads, (recommend water sweepers using reclaimed water if readily available). j. Apply water three times daily or chemical soil stabilizers according to manufacturer's specifications to all unpaved parking or staging areas or unpaved road surfaces k. Enforce maximum traffic speed limits of 15 mph on all unpaved roads. l. Where appropriate, pave all construction access roads at least 100 feet onto the site from the main road.	WRP Operator	Approval of Fugitive Dust Emission Control Plan Field Verification	1. SCAQMD 2. WRP Operator 3. Prior to Grading and During Construction

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.10 AIR QUALITY (cont.)			
The proposed WRP would be subject to SCAQMD Rule 1113 which prohibits persons from supplying, selling, applying, or soliciting the application of architectural coatings which do not meet specific emissions thresholds. The following mitigation measures address this rule:			
5.0-42. Building materials, architectural coatings, and cleaning solvents used in developing the WRP shall comply with all applicable SCAQMD rules and regulations.	WRP Operator	Provide List of Materials, Coating, Solvents That Comply with SCAQMD Rules and Regulations Field Verification	1. SCAQMD 2. WRP Operator 3. Prior to Issuance of Permit to Construct and Verify During Construction
5.0-43. The application of architectural coatings shall occur via hand application or spray equipment that emits volatile organic compound emissions at rates which are comparable to High Volume, Low Pressure (HVLP) spray equipment (i.e., equipment which is operated at an air pressure between 0.1 and 10 pounds per square inch).	WRP Operator	Field Verification	1. SCAQMD 2. WRP Operator 3. During Construction

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.10 AIR QUALITY (cont.)			
5.0-44. Building construction shall utilize low-polluting construction materials and coatings (i.e., bricks, stones, pre-coated or naturally colored materials, water-based paints or similar types of coating materials containing relatively low levels of volatile organic compounds) to the greatest extent feasible.	WRP Operator	Provide List of Construction Materials and Coatings with VOC Ratings Field Verification	1. SCAQMD 2. WRP Operator 3. Prior to Permit to Construct and Verify During Construction

Emission reductions resulting from the imposition of the mitigation measures listed above have been quantified wherever possible pursuant to the methodology in the SCAQMD's CEQA Air Quality Handbook. The following discussion provides a quantification of emission reductions associated with the grading of the WRP site. A quantification of emission reductions due to the remaining construction measures have not been completed since the information necessary to conduct such an analysis, per SCAQMD methodologies, is not available at this time. However, substantial emission reductions would also result from these non-quantified construction mitigation measures.

Grading activities associated with the WRP are predicted to generate approximately 1,744.0 pounds of PM_{10} per day. The application of non-toxic soil stabilizers, the replacement of ground cover, and the wetting down of graded areas, as identified above in Mitigation Measure 5.0-41 would each reduce these emission by approximately 30 percent, 15 percent, and 34 percent, respectively. The combined percentage reduction for these measures is calculated by progressively applying the percentage reduction attributable to an individual mitigation measure to the net emissions resulting from the application of the preceding mitigation measure. When this occurs, the reduction that these three measures would provide is 60.7 percent, which equates to 1,058.6 pounds of dust per day. Net emissions of approximately 685.4 pounds per day would continue to exceed the SCAQMD's recommended threshold of 150.0 pounds per day.

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.10 AIR QUALITY (cont.)			
OPERATION IMPACTS			
5.0-45. Comply with SCAQMD Regulation IX, Subpart O, which establishes specific air quality performance standards for wastewater treatment plants.	WRP Operator	Periodic Field Verification	1. SCAQMD 2. WRP Operator 3. During WRP Operation
5.0-46. Provide odor control equipment, covers, seals, etc., at all locations where odorous gases could be released into the atmosphere; implement managerial controls, including routine monitoring of control equipment and regular field surveys of surrounding areas; and conduct a complaint response program that achieves resolution to odor complaints within thirty minutes of receiving a complaint.	WRP Operator WRP Operator	Plan Check Approval of Complaint Response Program Field Verification	1. SCAQMD 2. WRP Operator 3. During WRP Design and Operation
5.0-47. Obtain permits to construct and operate all new sources of criteria air pollutants, at each stage of WRP development, and whenever any new sources are added or replaced, pursuant to SCAQMD Regulation XIII.	WRP Operator	Receipt of SCAQMD Permits	1. SCAQMD 2. WRP Operator 3. Prior to Issuance of Building Permits and Whenever New Sources are Added or Replaced
5.0-48. Obtain permits to construct and operate all new sources of air toxic emissions at each stage of WRP development, and whenever any new sources are added or replaced, pursuant to SCAQMD Regulation XIV.	WRP Operator	Receipt of SCAQMD Permits	1. SCAQMD 2. WRP Operator 3. Prior to Issuance of Permit to Construct and Whenever New Sources are Added or Replaced
5.0-49. Comply with the provisions of Title V of the Federal Clean Air Act, relative to maximum, facility-side toxic air emissions.	WRP Operator	Field Verification	1. SCAQMD 2. WRP Operator 3. During WRP Operation

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.11 WATER RESOURCES			
5.0-50. The site of the proposed water reclamation plant shall be annexed to the Valencia Water Company prior to issuance of building permits for the WRP.	WRP Operator	Annexation	1. CPUC 2. WRP Operator 3. Prior to Water Reclamation Plant Construction
5.0-51. Prior to construction of the proposed water reclamation plant, the WRP operator shall demonstrate water availability for both construction and operation demands.	WRP Operator	Receipt of VWC Will-Serve Letter	1. LA County Department of Regional Planning 2. WRP Operator 3. Prior to Grading

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.12 WASTEWATER DISPOSAL			
5.0-52. A new County sanitation district shall be formed to administer operation of the Newhall Ranch water reclamation plant. The district shall encompass the entire Newhall Ranch Specific Plan site.	WRP Operator	Approval of District Formation	1. Los Angeles County Board of Supervisors 2. WRP Operator 3. Prior to Issuance of WRP Grading Permit
5.0-52(b) The applicant shall initiate a request to the new County sanitation district formed for the Newhall Ranch Specific Plan site to adopt an ordinance prohibiting the installation and use of self-regenerating water softeners within the new sanitation district prior to connection of the first residential unit to the sanitary sewer system.	Specific Plan Applicant	Upon Filing of Construction Permit(s) for Water Reclamation Plant	1. Los Angeles County Board of Supervisors 2. Los Angeles County Department of Regional Planning 3. Prior to Issuance of WRP Grading Permit
5.0-53. The Newhall Ranch water reclamation plant shall be designed and operated to satisfy the requirements of Title 22 of the California Administrative Code, which regulates reuse of reclaimed water.	WRP Operator	Plan Check Field Verification	1. RWQCBLAR 2. WRP Operator 3. Prior to Issuance of Construction Permits and Verify During WRP Operation
5.0-54. The Newhall Ranch water reclamation plant shall be designed and operated to satisfy the California Regional Water Quality Control Board, Los Angeles Region discharge limits for reclaimed water discharged to the Santa Clara River and for the irrigation of landscaped areas.	WRP Operator	Plan Check Field Verification	1. RWQCBLAR 2. WRP Operator 3. Prior to Issuance of Construction Permits and Verify During WRP Operation
5.0-55. The Newhall Ranch water reclamation plant shall obtain a National Pollutant Discharge Elimination System permit from the California Regional Water Quality Control Board, Los Angeles Region for reclaimed water discharged to the Santa Clara River and for the irrigation of landscaped areas.	WRP Operator	Receipt of NPDES Permit(s)	1. RWQCBLAR 2. WRP Operator 3. Prior to Issuance of Construction Permits
5.0-56. All facilities of the sanitary sewer system will be designed and constructed for maintenance by the County of Los Angeles Department of Public Works and County Sanitation Districts of Los Angeles County, and/or the new County sanitation district or similar entity in accordance with their manuals, criteria, and requirements.	Applicant (Civil Engineer)	Review of Final Sewer Plans Field Verification	1. LACDPW and WRP Operator 2. LACDPW and WRP Operator 3. Prior to Acceptance for Maintenance

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.13 NATURAL GAS			
5.0-57. WRP design shall comply with the Energy Building Regulations adopted by the California Energy Commission (Title 24 of the California Administrative Code).	WRP Operator	Plan Check	1. WRP Operator 2. WRP Operator 3. Prior to Water Reclamation Plant Construction
5.14 ELECTRICITY			
5.0-58. Plant design shall comply with the Energy Building Regulations adopted by the California Energy Commission (Title 24 of the California Administrative Code).	WRP Operator	Plan Check	1. WRP Operator 2. WRP Operator 3. Prior to Water Reclamation Plant Construction
5.15 SOLID WASTE DISPOSAL			
5.0-59. The operators of the water reclamation plant shall ensure that all solid waste diversion, storage, and disposal requirements that are in effect at the time the WRP is constructed, including AB 939 and all others, will be implemented so that the waste generated by the WRP will not impede the County's waste reduction and diversion requirements during construction and operation.	WRP Operator	Field Verification	1. WRP Operator 2. WRP Operator 3. During WRP Construction and Operation
5.16 EDUCATION			
No impact on schools would result from construction or operation of the WRP; therefore, no mitigation measures are required or recommended.			

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.17 POLICE SERVICES			
5.0-60. If construction of the WRP occurs while SR-126 is still a two-lane highway, a construction traffic management plan shall be prepared and implemented. This plan shall address site access, staging and storage areas, hours of construction, work crew parking, warning and traffic control signs and devices, flag men, temporary detouring, etc., as appropriate.	WRP Applicant (Construction Superintendent)	Approval of Construction Traffic Management Plan Field Verification	1. WRP Operator 2. WRP Operator 3. Prior to and During Grading and Construction Activities
5.0-61. Consult with the CHP and the Sheriff's Department to incorporate measures into the risk management and prevention plan to optimize their abilities to provide assistance in the event of a hazardous materials incident at the operating WRP site.	WRP Operator	Incorporate CHP and Sheriff's Department Comments in RMPP	1. Cal-EPA 2. WRP Operator 3. Prior to Water Reclamation Plant Operation
5.0-62. Prepare and implement worker safety programs in accordance with Cal-OSHA requirements.	WRP Operator	Review of Worker Safety Program Field Verification	1. Cal-OSHA 2. WRP Operator 3. Prior to and During WRP Operation
5.0-63. Prepare and implement an "Integrated Emergency Response Plan" (IERP). The IERP provides procedures for personnel medical emergencies, evacuation procedures and mitigation and abatement procedures for hazardous chemicals. The plan must conform to multiple regulatory requirements, including Title 8 §3220, Emergency Action Plan, §3221, Fire Prevention Plan, §5192 Emergency Response to Hazardous Substances Releases, and Title 22, §66265.50-66265.56, Contingency Plan and Emergency Procedures.	WRP Operator	Review of IERP Field Verification	1. Los Angeles Co. Fire Department 2. WRP Operator 3. Prior to and During WRP Operation

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.18 FIRE SERVICES AND HAZARDS			
5.0-64. If construction of the WRP occurs while SR-126 is still a two-lane highway, a construction traffic management plan shall be prepared and implemented. This plan shall address site access, staging and storage areas, hours of construction, work crew parking, warning and traffic control signs and devices, flag men, temporary detouring, etc., as appropriate.	WRP Applicant (Construction Superintendent)	Approval of Construction Traffic Management Plan Field Verification	1. WRP Operator 2. WRP Operator 3. Prior to and During Grading and Construction Activities
5.0-65. Consult with the Fire Department and its Hazardous Materials Unit to incorporate measures into the risk management and prevention plan, to optimize its abilities to respond to a hazardous materials incident at the operating WRP site.	WRP Site Designer/ Engineer	Incorporate Fire Department Comments in RMPP	1. Cal-EPA 2. WRP Operator 3. Prior to Water Reclamation Plant Operation
5.0-66. Prepare and implement worker safety programs in accordance with Cal-OSHA requirements.	WRP Operator	Review of Worker Safety Program Field Verification	1. Cal-OSHA 2. WRP Operator 3. Prior to and During WRP Operation
5.0-67. Prepare and implement an "Integrated Emergency Response Plan" (IERP). The IERP provides procedures for personnel medical emergencies, evacuation procedures and mitigation and abatement procedures for hazardous chemicals. The plan must conform to multiple regulatory requirements, including Title 8 §3220, Emergency Action Plan, §3221, Fire Prevention Plan, §5192 Emergency Response to Hazardous Substances Releases, and Title 22, §66265.50-66265.56, Contingency Plan and Emergency Procedures.	WRP Operator	Review of IERP Field Verification	1. Los Angeles Co. Fire Department 2. WRP Operator 3. Prior to and During WRP Operation

Mitigation Measures/Conditions of Approval	Party Responsible for Implementing Mitigation	Monitoring Action	1. Enforcement Agency 2. Monitoring Agency 3. Monitoring Phase
5.19 LIBRARIES			
No adverse library impacts have been identified; therefore no mitigation measures are required.			
5.20 PARKS, RECREATION AND TRAILS			
5.0-68. A fence shall be constructed along the southern perimeter of the WRP site to prevent access to the WRP from the Regional River Trail.	WRP Operator	Field Verification	1. Los Angeles Co. Department of Regional Planning 2. WRP Operator 3. Prior to Water Reclamation Plant Operation
5.21 POPULATION, HOUSING AND EMPLOYMENT			
No significant population, housing, or employment impacts have been identified; therefore, no mitigation measures are required.			

APPENDIX D

Species Matrices

Sensitive Species Impacts Matrix

Sensitive Species Impacts Matrix

Species ***Scientific Name*** **Common Name**	San Diego fairy shrimp *Branchinecta sandiegoensis*	Monarch butterfly *Danaus plexippus*	Quino checkerspot *Euphydryas editha quino*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	No	No	No
Species impacted directly by habitat loss? (Yes/No)	No	No	No
Habitat loss substantial? (Yes/No)	No	No	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	No	No	No
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	No	No	No
Mitigation	No	No	No

Species ***Scientific Name*** **Common Name**	San Emigdio blue *Plebulina emigdionis*	Riverside fairy shrimp *Streptocephalus wootoni*	Santa Ana sucker *Catostomus santaanae*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	No	No	Yes
Species impacted directly by habitat loss? (Yes/No)	No	No	Yes
Habitat loss substantial? (Yes/No)	No	No	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	No	No	Yes
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	Yes
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	No	No	Yes
Mitigation	No	No	Yes

Species ***Scientific Name*** **Common Name**	Unarmored three-spine stickleback *Gasterosteus aculeatus williamsoni*	Arroyo chub *Gila orcutti*	Steelhead trout *Oncorhynchus mykiss*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	Yes	No
Species impacted directly by habitat loss? (Yes/No)	Yes	Yes	No
Habitat loss substantial? (Yes/No)	No	No	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	Yes	Yes	No
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	Yes	Yes	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	Yes	No
Mitigation	Yes	Yes	No

Species ***Scientific Name*** **Common Name**	Arroyo toad *Bufo californicus*	California red-legged frog *Rana draytonii*	Western spadefoot *Spea hammondii*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	No	Yes
Species impacted directly by habitat loss? (Yes/No)	Yes	No	Yes
Habitat loss substantial? (Yes/No)	No	No	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	Yes	No	Yes
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	No	Yes
Mitigation	Yes	No	Yes

Species **Common Name** *Scientific Name*	Silvery legless lizard *Anniella pulchra pulchra*	Coastal western whiptail *Aspidoscelis tigris stejnegeri*	Rosy boa *Charina trivirgata*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	Yes	Yes
Species impacted directly by habitat loss? (Yes/No)	Yes	Yes	Yes
Habitat loss substantial? (Yes/No)	Yes	Yes	Yes
Species impacted directly on adjacent lands by edge effects? (Yes/No)	No	No	No
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	Yes	Yes	Yes
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	Yes	Yes
Mitigation	Yes	Yes	Yes

Species **Common Name** *Scientific Name*	Southwestern pond turtle *Clemmys marmorata pallida*	San Bernardino ringneck snake *Diadophis punctatus modestus*	Coast horned lizard *Phrynosoma coronatum*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	Yes	Yes
Species impacted directly by habitat loss? (Yes/No)	Yes	Yes	Yes
Habitat loss substantial? (Yes/No)	No	Yes	Yes
Species impacted directly on adjacent lands by edge effects? (Yes/No)	Yes	No	No
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	Yes	Yes
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	Yes	Yes
Mitigation	Yes	Yes	Yes

Species **Common Name** *Scientific Name*	Coast patch-nosed snake *Salvadora hexalepis virgultea*	Two-striped garter snake *Thamnophis hammondii*	Cooper's hawk *Accipiter cooperii*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	Yes	Yes
Species impacted directly by habitat loss? (Yes/No)	Yes	Yes	Yes
Habitat loss substantial? (Yes/No)	Yes	No	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	No	Yes	Yes
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	Yes	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	Yes	Yes
Mitigation	Yes	Yes	Yes

Species **Common Name** ***Scientific Name***	Sharp-shinned hawk *Accipiter striatus*	Tricolored blackbird *Agelaius tricolor*	Southern California rufous-crowned sparrow *Aimophila ruficeps canescens*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	No (i.e., nesting habitat)	Yes	Yes
Species impacted directly by habitat loss? (Yes/No)	No	Yes	Yes
Habitat loss substantial? (Yes/No)	No	No	Yes
Species impacted directly on adjacent lands by edge effects? (Yes/No)	No	Yes	No
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	Yes
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	No	Yes	Yes
Mitigation	No	Yes	Yes

Species **Common Name** *Scientific Name*	Bell's sage sparrow *Amphispiza belli belli*	Great egret *Ardea alba*	Great blue heron *Ardea herodias*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	No (i.e. rookery)	No (i.e. rookery)
Species impacted directly by habitat loss? (Yes/No)	Yes	No	No
Habitat loss substantial? (Yes/No)	Yes	No	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	No	No	No
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	Yes	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	No	No
Mitigation	Yes	No	No

Species **Common Name** *Scientific Name*	Long-eared owl *Asio otus*	Western burrowing owl *Athene cunicularia*	Ferruginous hawk *Buteo regalis*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	Yes	No (i.e. nesting)
Species impacted directly by habitat loss? (Yes/No)	Yes	Yes	No
Habitat loss substantial? (Yes/No)	No	Yes	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	Yes	No	No
Potential to eliminate species on site? (Yes/No)	No	Yes	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	Yes	No
Mitigation	Yes	Yes	No

Species **Common Name** *Scientific Name*	Lawrence's goldfinch *Carduelis lawrencei*	Northern harrier *Circus cyaneus*	Western yellow-billed cuckoo *Coccyzus americanus occidentalis*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	Yes	Yes
Species impacted directly by habitat loss? (Yes/No)	Yes	Yes	Yes
Habitat loss substantial? (Yes/No)	No	Yes	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	Yes	No	Yes
Potential to eliminate species on site? (Yes/No)	No	Yes	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	Yes	Yes
Mitigation	Yes	Yes	Yes

Species **Common Name** *Scientific Name*	Yellow warbler *Dendroica petechia brewsteri*	White-tailed kite *Elanus leucurus*	Southwestern willow flycatcher *Empidonax traillii extimus*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	Yes	Yes
Species impacted directly by habitat loss? (Yes/No)	Yes	Yes	Yes
Habitat loss substantial? (Yes/No)	No	Yes	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	Yes	Yes	Yes
Potential to eliminate species on site? (Yes/No)	No	Yes	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	Yes	Yes
Mitigation	Yes	Yes	Yes

Species **Common Name** *Scientific Name*	California horned lark *Eremophila alpestris actia*	Merlin *Falco columbarius*	Prairie falcon *Falco mexicanus*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	No (i.e., nesting)	No (i.e., nesting)
Species impacted directly by habitat loss? (Yes/No)	Yes	No	No
Habitat loss substantial? (Yes/No)	Yes	No	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	Yes	No	No
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	Yes	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	No	No
Mitigation	Yes	No	No

Species **Common Name** *Scientific Name*	Yellow-breasted chat *Icteria virens*	Least bittern *Ixobrychus exilis*	Loggerhead shrike *Lanius ludovicianus*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	No (i.e., nesting)	Yes
Species impacted directly by habitat loss? (Yes/No)	Yes	No	Yes
Habitat loss substantial? (Yes/No)	No	No	Yes
Species impacted directly on adjacent lands by edge effects? (Yes/No)	Yes	No	No
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	No	Yes
Mitigation	Yes	No	Yes

Species **Common Name** *Scientific Name*	Summer tanager *Piranga rubra*	Coastal California gnatcatcher *Polioptila californica californica*	Bank swallow *Riparia riparia*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	No	No (i.e., nesting habitat)
Species impacted directly by habitat loss? (Yes/No)	Yes	No	No
Habitat loss substantial? (Yes/No)	No	No	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	Yes	No	No
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	No	No
Mitigation	Yes	No	No

Species **Common Name** *Scientific Name*	Least bell's vireo *Vireo bellii pusillus*	Pallid bat *Antrozous pallidus*	Pale big-eared bat *Corynorhinus townsendii pallescens*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	Yes (i.e., foraging)	Yes
Species impacted directly by habitat loss? (Yes/No)	Yes	No	Yes
Habitat loss substantial? (Yes/No)	No	No	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	Yes	No	Yes
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	No	Yes
Mitigation	Yes	No	Yes

Species **Common Name** *Scientific Name*	Spotted bat *Euderma maculata*	Western mastiff bat *Eumops perotis californicus*	Mountain lion *Felis concolor*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	No	Yes	Yes
Species impacted directly by habitat loss? (Yes/No)	No	Yes	Yes
Habitat loss substantial? (Yes/No)	No	No	Yes
Species impacted directly on adjacent lands by edge effects? (Yes/No)	No	Yes	No
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	No	Yes	Yes
Mitigation	No	Yes	No

Species **Common Name** *Scientific Name*	San Diego black-tailed jackrabbit *Lepus californicus bennettii*	Fringed myotis *Myotis thysanodes*	Yuma myotis *Myotis yumanensis*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	Yes	Yes
Species impacted directly by habitat loss? (Yes/No)	Yes	Yes	Yes
Habitat loss substantial? (Yes/No)	Yes	No	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	No	Yes	Yes
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	Yes	Yes
Mitigation	Yes	Yes	Yes

Species **Common Name** *Scientific Name*	San Diego desert woodrat *Neotoma lepida intermedia*	Southern grasshopper mouse *Onychomys torridus ramona*	Los Angeles pocket mouse *Perognathus longimembris brevinasus*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes	No	No
Species impacted directly by habitat loss? (Yes/No)	Yes	No	No
Habitat loss substantial? (Yes/No)	Yes	No	No
Species impacted directly on adjacent lands by edge effects? (Yes/No)	No	No	No
Potential to eliminate species on site? (Yes/No)	No	No	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No	No	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	Yes	No	No
Potential restriction of range of rare or endangered species? (Yes/No)	No	No	No
Impacts significant? (Yes/No)	Yes	No	No
Mitigation	Yes	No	No

Species **Common Name** *Scientific Name*	American badger *Taxidea taxus*
Habitat present and species is reasonably expected to occur on-site? (Yes/No)	Yes
Species impacted directly by habitat loss? (Yes/No)	Yes
Habitat loss substantial? (Yes/No)	Yes
Species impacted directly on adjacent lands by edge effects? (Yes/No)	No
Potential to eliminate species on site? (Yes/No)	No
Potential to reduce population size below self-sustaining levels? (Yes/No)	No
Potential for substantial reduction in numbers of individuals? (Yes/No)	No
Potential restriction of range of rare or endangered species? (Yes/No)	No
Impacts significant? (Yes/No)	Yes
Mitigation	Yes

Wildlife Matrix

Wildlife Species Observed on the Newhall Ranch or Occurring in the Region

Scientific Name	Common Name	Habitat	Wi	Sp	Su	Au
BIRDS						
PODICIPEDIDAE	GREBES					
Podilymbus podiceps	Pied-billed Grebe	Aq	C	C	U?	C
ARDEIDAE	HERONS and EGRETS					
Ixobrychus exilis hesperis	Least Bittern	Aq,Gr/OS,RW	U	U	U	U
Ardea herodias herodias	Great Blue Heron	Aq,Gr/OS,RW	C	C	C*	C
Casmerodius albus	Great Egret	Aq,Gr/OS,RW	U	U	R	U
Egretta thula thula	Snowy Egret	Aq,Gr/OS,RW	U	U	R	U
Bubulcus ibis	Cattle Egret	Gr/OS	R	R		R
Butorides virescens	Green Heron	Aq,OR,RW	U	U	U	U
Nycticorax nycticorax hoactli	Black-crowned Night-heron	Aq,OR,RW	C	C	C	C
ANATIDAE	GEESE and DUCKS					
Dendrocygna bicolor	Fulvous Whistling-duck	Aq/RW	U	U		
Anas crecca	Green-winged Teal	Aq,RW	C	C	R	C
Anas cyanoptera	Cinnamon Teal	Aq,RW	C	C	U	C
Anas platyrhynchos platyrhynchos	**Mallard**	Aq,RW	C	C	C?	C
Anas americana	American Wigeon	Aq,RW	C	C	Ca	C
Oxyura jamaicensis	Ruddy Duck	Aq,RW	C	C	U	C
CATHARTIDAE	VULTURES					

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Sc = Scrub habitats: coastal sage scrub to low chaparral.

Scientific Name	Common Name	Habitat	Wi	Sp	Su	Au
BIRDS						
Cathartes aura	**Turkey Vulture**	RW,Gr/OS,Sc	C	C	C?	U
ACCIPITRIDAE	HAWKS, KITES, and EAGLES					
Elanus leucurus	**White-tailed Kite**	RW,Gr/OS,OR. Sc	U	U	U?	U
Circus cyaneus	**Northern Harrier**	RW,Gr/OS,OR	U	U	R?	U
Accipiter striatus	Sharp-shinned Hawk	RW,Gr/OS,Sc	U	U		U
Accipiter cooperii	**Cooper's Hawk**	RW,Gr/OS,Sc	U	U	R*	U
Buteo lineatus elegans	**Red-shouldered Hawk**	RW,Gr/OS,Sc,OR	U	U	U?	U
Buteo jamaicensis	**Red-tailed Hawk**	RW,GR/OS,Sc	U	U	U?	U
Buteo swainsoni	Swainson's Hawk	RW,Gr/OS,OR		Ca		Ca
ACCIPITRIDAE (cont.)	HAWKS and EAGLES					
Buteo regalis	Ferruginous Hawk	Gr/OS	R		R	
Aquila chrysaetos	Golden Eagle	Gr/OS,Sc	R	R	U	R
Falco sparverius	**American Kestrel**	RW,Gr/OS,OR,Sc	C	C	C*	C
Falco columbarius	Merlin	Gr/OS,OR,Sc	U			U
Falco mexicanus	Prairie Falcon	Gr/OS,OR,Sc	R	R	R?	R
Falco peregrinus anatum	American Peregrine Falcon	Gr/OS,OR	R	R	R	R
PHASIANIDAE	QUAIL					
Callipepla californica	**California Quail**	RW,Gr/OS,Sc	C	C	C*	C
RALLIDAE	RAILS and COOTS					

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BIRDS						
Porzana carolina	Sora	Aq	U	U		U
Fulica americana	American Coot	Aq	C	C	C*	C
CHARADRIIDAE	PLOVERS					
Charadrius vociferus	Killdeer	Aq,RW,OR	C	C	C*	C
Charadrius montanus	Mountain Plover	OS	U			
SCOLOPACIDAE	SANDPIPERS					
Calidris minutilla	Least Sandpiper	Aq,OR	U	U		
Tringa hypoleucos	Spotted sandpiper	Aq,OR	U	U	R	
COLUMBIDAE	PIGEONS and DOVES					
Columba livia	**Rock Dove**	Gr/OS,DR	C	C	C*	C
Columba fasciata	Band-tailed Pigeon	RW,Gr/OS	R	R		R
*Columba livia**	Domestic Pigeon	RW, Gr/OS,DR	Ca	Ca	Ca	Ca
Streptopelia chinensis	Spotted Dove	RW,DR	Ca	Ca	Ca?	Ca
Zenaida macroura	**Mourning Dove**	RW,Gr/OS,Sc,DR	C	C	C*	C
CUCULIDAE	CUCKOOS					
Coccyzus americanus occidentalis	Western Yellow-billed Cuckoo	RW		Ca	Ca*	Ca
Geococcyx californianus	Greater Roadrunner	Sc,RW	U	U	U*	U
TYTONIDAE	BARN OWLS					
Tyto alba	Barn Owl	RW,Gr/OS,Sc,DR	U	U	U*	U

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BIRDS						
STRIGIDAE	OWLS					
Bubo virginianus	Great Horned Owl	RW,Gr/OS,Sc,OR	U	U	U*	U
Athene cunicularia	Western Burrowing Owl	Gr/OS,Sc	R	R	R?	R
Asio otus	Long-eared Owl	RW	R		Ca?	
Asio flammeus	Short-eared Owl	Gr/OS	U			
APODIDAE	SWIFTS					
Aeronautes saxatalis	**White-throated Swift**	Aq,RW,OR,Sc,DR	C	C	C*	C
TROCHILIDAE	HUMMINGBIRDS					
Archilochus alexandri	Black-chinned Hummingbird	RW,OR,Sc		U	U*	R
Calypte anna	Anna's Hummingbird	RW,Gr/OS,Sc,DR	C	C	C*	C
Calypte costae	Costa's Hummingbird	RW,OR,Sc		C	C*	U
Selasphorus rufus	Rufous Hummingbird	RW,Gr/OS,Sc		U		U
Selasphorus sasin	Allen's Hummingbird	RW,Gr/OS,Sc		C	C*	U
ALCEDINIDAE	KINGFISHERS					
Ceryle alcyon	Belted Kingfisher	Aq	U	R		R
PICIDAE	WOODPECKERS					
Melanerpes formicivorus	Acorn Woodpecker	Gr/OS,RW	C	C	C*	C
Sphyrapicus ruber	Red-breasted Sapsucker	Gr/OS,RW	U	R		U
Picoides nuttallii	Nuttall's Woodpecker	RW,Gr/OS,Sc	C	C	C*	C

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BIRDS						
Picoides pubescens	Downy Woodpecker	RW,Gr/OS	C	C	C*	C
Picoides villosus	Hairy Woodpecker	RW,Gr/OS	U	U	U*	U
Colaptes auratus	Northern Flicker	RW,Gr/OS,Sc	C	C	U*	C
TYRANNIDAE	FLYCATCHERS					
Contopus borealis	Olive-sided Flycatcher	RW,Gr/OS	R	R		
Contopus sordidulus	Western Wood-pewee	RW,Gr/OS		U	R*	U
Empidonax traillii	Willow Flycatcher	RW		R		U
Empidonax hammondii	Hammond's Flycatcher	RW,Gr/OS,Sc		R		R
Empidonax difficilis	Pacific-slope Flycatcher	RW,Gr/OS		C	C*	C
Sayornis nigricans	**Black Phoebe**	RW,OR,Gr/OS	C	C	C*	C
Sayornis saya	Say's Phoebe	Gr/OS,Sc	C	C	R?	C
Pyrocephalus rubinus flammeus	Vermilion Flycatcher	RW		Ca		Ca
Myiarchus cinerascens cinerascens	**Ash-throated Flycatcher**	RW,Gr/OS,Sc		Ca	C?	Ca
Tyrannus vociferans vociferans	Cassin's Kingbird	Gr/OS,Sc	U	U	U?	U
Tyrannus verticalis	Western Kingbird	RW,Gr/OS,Sc	U	U	U*	U
ALAUDIDAE	LARKS					
Eremophila alpestris actia	**California Horned Lark**	Gr/OS	C	C	U*	C
HIRUNDINIDAE	SWALLOWS					
Tachycineta bicolor	**Tree Swallow**	Aq,RW,Gr/OS, OR	R	C	U	R

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BIRDS						
Tachycineta thalassina	**Violet-green Swallow**	Aq,RW,Gr/OS, OR,Sc	R	C	U	R
Stelgidopteryx serripennis	Northern Rough-winged Swallow	RW,Gr/OS,OR,Sc	U	C	C	R
Petrochelidon pyrrhonota	**Cliff Swallow**	Aq,RW,Gr/OS, OR,Sc	R	C	C	R
Hirundo rustica	Barn Swallow	RW,Gr/OS,OR,Sc	R	A	C	R
CORVIDAE	JAYS, CROWS, and RAVENS					
Aphelocoma coerulescens	**Scrub Jay**	RW,Gr/OS,Sc,DR	C	C	C*	C
Pica nuttalli	Yellow-billed Magpie	Gr/OS	U	U	U*	U
Corvus brachyrhynchos hesperis	**American Crow**	RW,Gr/OS,DR,Sc	C	C	C*	C
Corvus corax clarionensis	**Common Raven**	Gr/OS,Sc,DR,OR	U	U	U?	U
PARIDAE	CHICKADEES and TITMICE					
Baeolophus inornatus	Oak Titmouse	RW,Gr/OS,Sc	C	C	C*	C
AEGITHALIDAE	BUSHTITS					
Psaltriparus minimus	**Bushtit**	RW,Sc,Gr/OS,DR	C	C	C*	C
SITTIDAE	NUTHATCHES					
Sitta canadensis	Red-breasted Nuthatch	RW,Gr/OS	R	Ca		R
Sitta carolinensis	White-breasted Nuthatch	RW,Gr/OS	U	U	U*	U
TROGLODYTIDAE	WRENS					
Salpinctes obsoletus	**Rock Wren**	DR,Sc	R	R	R*	R

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BIRDS						
Salpinctes mexicanus	**Canyon Wren**	Sc	R	R	R	R
Thryomanes bewickii	**Bewick's Wren**	RW,Sc	C	C	C*	C
Troglodytes aedon	**House Wren**	RW,Gr/OS,Sc		U	U*	U
Cistothorus palustris	Marsh Wren	RW,OR	U	U	U*	U
MUSCICAPIDAE	THRUSHES, GNATCATCHERS, and WRENTIT					
Regulus calendula	Ruby-crowned Kinglet	RW,Gr/OS,Sc	C	C		C
Polioptila caerulea	Blue-gray Gnatcatcher	RW,Sc		U	U?	U
Sialia mexicana	Western Bluebird	RW,Gr/OS,Sc	U	U	U*	U
Catharus guttatus	**Hermit Thrush**	RW,Gr/OS,Sc	C	C		C
Catharus ustulatus	Swainson's Thrush	RW,Sc		C	U?	C
Turdus migratorius	**American Robin**	Aq,RW,Gr/OS,Sc, DR	C	C	U*	C
Chamaea fasciata	**Wrentit**	RW,Sc	C	C	C*	C
MIMIDAE	MOCKINGBIRDS and THRASHERS					
Mimus polyglottos	**Northern Mockingbird**	RW,Gr/OS,Sc,DR	U	U	U*	U
Toxostoma redivivum	**California Thrasher**	RW,Sc	C	C	C*	C
MOTACILLIDAE	PIPITS					
Anthus rubescens	American Pipit	Gr/OS,OR,DR	U	U		U
BOMBYCILLIDAE	WAXWINGS					

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BIRDS						
Bombycilla cedrorum	Cedar Waxwing	RW,Gr/OS,Sc	U	U		U
PTILOGONATIDAE	PHAINOPEPLAS					
Phainopepla nitens	Phainopepla	RW,GR/OS,Sc	U	U	U	U
LANIIDAE	SHRIKES					
Lanius ludovicianus	Loggerhead Shrike	RW,Gr/OS,Sc,DR	C	C	U*	C
STURNIDAE	STARLINGS					
Sturnus vulgaris*	**European Starling**	RW,Gr/OS,DR	A	A	A*	A
VIREONIDAE	VIREOS					
Vireo bellii pusillus	**Least Bell's Vireo**	RW		R	R*	R
Vireo solitarius	Solitary Vireo	RW,Gr/OS		R		R
Vireo huttoni	Hutton's Vireo	RW,Gr/OS	C	C	C*	C

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BIRDS						
Vireo gilvus	Warbling Vireo	RW,Gr/OS		C	C*	C
EMBERIZIDAE	WARBLERS, SPARROWS, and ORIOLES					
Vermivora celata	**Orange-crowned Warbler**	RW,Gr/OS,Sc	C	C	U*	C
Vermivora ruficapilla	Nashville Warbler	RW,GR/OS		U		U
Dendroica coronata	**Yellow-rumped Warbler**	RW,Gr/OS,Sc,DR	A	C		C
Dendroica nigrescens	Black-throated Gray Warbler	RW,Gr/OS,Sc	U	U	U	U
Dendroica petechia	**Yellow Warbler**	RW,Gr/OS,Sc		C	U*	C
Dendroica townsendi	Townsend's Warbler	RW,Gr/OS,Sc	U	C		C
Oporornis tolmiei	MacGillivray's Warbler	RW,GR/OS, SC	U			U
Geothlypis trichas	**Common Yellowthroat**	Aq,RW,OR	C	C	C*	C
Wilsonia pusilla	**Wilson's Warbler**	RW,Gr/OS,Sc	R	C	U*	C
Icteria virens	**Yellow-breasted Chat**	RW		U	U*	U
Piranga rubra	Summer Tanager	RW	U	U		U
Piranga ludoviciana	Western Tanager	RW,Gr/OS,Sc		C		U
Pheucticus melanocephalus	Black-headed Grosbeak	RW,Sc,Gr/OS		C	C*	U
Guiraca caerulea salicaria	Blue Grosbeak	RW,Sc,Gr/OS,DR		U	U*	Ca
EMBERIZIDAE (cont.)	WARBLERS, SPARROWS, and ORIOLES					
Passerina amoena	Lazuli Bunting	RW,Sc,Gr/OS		U	U*	U
Pipilo erythrophthalmus megalonyx	Rufous-sided Towhee	RW,Sc	C	C	C*	C

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BIRDS						
Pipilo crissalis	**California Towhee**	RW,Sc	C	C	C*	C
Aimophila ruficeps canescens	**Southern California Rufous-crowned Sparrow**	Sc	C	C	U*	C
Spizella passerina	Chipping Sparrow	Sc	R	R	R*	
Spizella atrogularis	Black-chinned Sparrow	Sc		Ca	Ca?	
Pooecetes gramineus	Vesper Sparrow	Gr/OS,Sc		R		R
Chondestes grammacus	Lark Sparrow	Gr/OS,OR,Sc	C	C	U*	C
Amphispiza belli	Bell's Sage Sparrow	Sc	R	R	R?	R
Passerculus sandwichensis	**Savannah Sparrow**	Aq,RW,Gr/OS,DR	C	C	C*	C
Melospiza melodia	Song Sparrow	RW,Sc,Aq,OR	C	C	C*	C
Melospiza lincolnii	Lincoln's Sparrow	RW,Sc	C	C		C
Zonotrichia atricapilla	Golden-crowned Sparrow	RW,Sc	C	C		C
Zonotrichia leucophrys	White-crowned Sparrow	RW,Gr/OS,Sc,DR	A	C		C
Junco hyemalis	Dark-eyed Junco	RW,Gr/OS,Sc	C	C	U*	C
Agelaius phoeniceus	**Red-winged Blackbird**	Aq,RW,Gr/OS,DR	C	C	C*	C
Agelaius tricolor	Tricolored Blackbird	Aq,RW,Gr/OS	U	U	R?	U
Sturnella neglecta	Western Meadowlark	Gr/OS	C	C	C*	C
Xanthocephalus xanthocephalus	Yellow-headed Blackbird	RW		U		U
Euphagus cyanocephalus	**Brewer's Blackbird**	RW,Gr/OS,Sc,DR	C	C	C*	C

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Scientific Name	Common Name	Habitat	Wi	Sp	Su	Au
BIRDS						
Molothrus ater	**Brown-headed Cowbird**	RW,Gr/OS,Sc,DR	C	C	C*	C
Icterus cucullatus	Hooded Oriole	Gr/OS,RW		R	R?	R
Icterus galbula	Northern Oriole	Gr/OS,RW		U	U*	U
FRINGILLIDAE	FINCHES					
Carpodacus purpureus	Purple Finch	RW,Gr/OS	U	U	U*	U
Carpodacus mexicanus	**House Finch**	RW,Sc,Gr/OS,DR	A	A	C*	A
Carduelis pinus	Pine Siskin	RW,Gr/OS,Sc	U	R		R
Carduelis psaltria	Lesser Goldfinch	RW,Gr/OS,Sc	C	C	C*	C
Carduelis lawrencei	**Lawrence's Goldfinch**	RW,Gr/OS,Sc	R	U	U	U
Carduelis tristis	American Goldfinch	RW,Gr/OS,Sc	C	C	C*	C
PASSERIDAE	WEAVERS					
Passer domesticus*	**House Sparrow**	RW,Gr/OS,Sc,DR	C	C	C*	C

		Habitat	Abundance
FISH			
Gasterosteus aculeatus williamsoni	**Unarmored Threespine Stickleback**	SCR	R
Cottus asper	Prickly Sculpin	SCR	C
Catostomus santaanae	**Santa Ana Sucker**	SCR	R
Gila orcutti	**Arroyo Chub**	SCR	R
Gambusia affinis*	**Mosquitofish**	SCR	A

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AMPHIBIANS							
CAUDATA	SALAMANDERS						
Aneides lugubris	Arboreal Salamander		U			U	
Batrachoseps nigriventris	Black-bellied Slender Salamander		C		U	C	
ANURA	FROGS & TOADS						
Bufo californicus	Arroyo Toad	R	R	R			
Bufo boreas	**Western Toad**	U	Ca	Ca		Ca	
Pseudacris regilla	**Pacific chorus frog**	A	C	C	U	U	
Rana aurora draytoni	California Red-legged Frog	Ca					
Scaphiopus hammondii	Western Spadefoot Toad	Ca					
Xenopus laevis*	**African Clawed Frog**	Ca					
REPTILES							
TESTUDINES	TURTLES						
Clemmys marmorata pallida	**Southwestern Pond Turtle**	Ca	Ca				
SQUAMATA	LIZARDS						
Anniella pulchra pulchra	**Silvery Legless Lizard**				U		
Gambelia wislizenii	Long-nosed Leopard Lizard				Ca		
Xantusia vigilis	Desert Night Lizard				U		
Elgaria multicarinatus webboo	**San Diego Alligator Lizard**		C	C	A	A	
Eumeces skiltonianus	**Western Skink**		U		U	C	

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REPTILES							
Uta stansburiana	**Side-Blotched Lizard**			C	U	U	C
Sceloporus occidentalis	**Western Fence Lizard**		U	R	U	A	C
Aspidoscelis tigris stejnegeri	Coastal Western Whiptail		U	C	C	U	
Phrynosoma coronatum	Coast Horned Lizard			R	R		
SQUAMATA	SNAKES						
Salvadora hexalepis virgultea	Coast Patch-nosed Snake				Ca		
Diadophis punctatus modestus	San Bernardino Ringneck Snake		U			U	
Hypsiglena torquata	Night Snake				U	U	
Thamnophis hammondii hammondii	**Two-striped Garter Snake**	R	R				
Lampropeltis getulus	**Common Kingsnake**		U		U	C	R
Pituophis melanoleucus annectens	**San Diego Gopher Snake**		U	U	C	C	R
Coluberr mormon	Racer				U	U	
Masticophis flagellum piceus	**Red Coachwhip**			R	U	U	
Crotalus viridis helleri	**Southern Pacific Rattlesnake**		Ca	R	C	R	R

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MAMMALS							
DIDELPHIDAE	OPOSSUMS						
Didelphis virginiana	Virginia Oppossum	U	C	C	U	U	R
SORICIDAE	SHREWS						
Sorex ornatus	Ornate Shrew		U		U		
Notiosorex crawfordi	Desert Shrew				Ca		
TALPIDAE	MOLES						
Scapanus latimanus	Broad-footed Mole		C	U	U	U	
VESPERTILIONIDAE	VESPERTILIONID BATS						
Myotis californicus	**California Myotis**		U	U	C	C	U
Myotis thysanodes	Fringed Myotis		Ca	Ca	Ca	Ca	
Myotis yumanensis	Yuma Myotis		U	U	U	C	
Lasiurus cinereus	Hoary Bat		U	U	U	U	
Pipistrellus hesperus	**Western Pipistrelle**		U	U	U	U	
Eptesicus fuscus	**Big Brown Bat**		U	U	U	U	
Euderma maculatum	Spotted Bat		Ca	Ca	Ca	R	
Corynorhinus townsendii pallescens	Pale Big-eared Bat		R	R	R	U	
Antrozous pallidus	**Pallid Bat**		U	U	U	C	
MOLOSSIDAE	MOLOSSID BATS						
Tadarida brasiliensis	**Brazilian Free-tailed Bat**		C	C	C	C	U

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MAMMALS							
Eumops perotis californicus	Western Mastiff-bat		R	R	R	R	
LEPORIDAE	HARES and RABBITS						
Sylvilagus audubonii	**Desert Cottontail**		U	C	C	C	U
Sylvilagus bachmani	Brush Rabbit		C		U		
Lepus californicus bennettii	San Diego Black-tailed Jackrabbit		U	C	C	C	R
SCIURIDAE	SQUIRRELS and CHIPMUNKS						
Tamias merriami	Merriam's Chipmunk				U		
Spermophilus beecheyi	**California Ground Squirrel**			U	C	A	C
Sciurus griseus	Western Gray Squirrel		U				
GEOMYIDAE	POCKET GOPHERS						
Thomomys bottae	**Botta's Pocket Gopher**		A	C	C	A	C
HETEROMYIDAE	KANGAROO RATS & POCKET MICE						
Perognathus longimembris brevinasus	Los Angeles Pocket Mouse				R	R	
Chaetodipus californicus	**California Pocket Mouse**		R		C		
Dipodomys agilis	**Pacific Kangaroo Rat**				U		
MURIDAE	MICE, RATS, and VOLES						
Reithrodontomys megalotis	**Western Harvest Mouse**		U		U	C	R
Peromyscus boylii	Brush Mouse		C		U		
Peromyscus californicus	**California Mouse**		C		U		

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MAMMALS							
Peromyscus maniculatus	**Deer Mouse**		U	U	C	U	R
Onychomys torridus	Grasshopper Mouse				R	R	
Neotoma fuscipes	**Dusky-footed Woodrat**		C		U	R	
Neotoma lepida intermedia	**San Diego Desert Woodrat**				C		
*Rattus rattus**	Black Rat						C
*Mus musculus**	House Mouse					U	C
Microtus californicus	**California Vole**	U	C	U	U	A	R
CANIDAE	CANIDS						
Canis latrans	**Coyote**		C	C	C	C	U
*Vulpes vulpes**	Red Fox		U	U	U	U	U
Urocyon cinereoargenteus	**Gray Fox**		R	R	C	U	
PROCYONIDAE	PROCYONIDS						
Procyon lotor	**Raccoon**	C	C	C	U	U	U
MUSTELIDAE	MUSTELIDS						
Mustela frenata	Long-tailed Weasel		U	R	R	C	
Taxidea taxus	American Badger				R	U	
Spilogale gracilis	Western Spotted Skunk				U	U	
Mephitis mephitis	**Striped Skunk**		C	U	U	C	U
FELIDAE	CATS						

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MAMMALS							
Felis concolor	Mountain Lion		Ca	Ca	Ca		Ca
Lynx rufus	**Bobcat**		U	U	U	U	
CERVIDAE	CERVIDS						
Odocoileus hemionus	**Mule Deer**		C	U	C	C	U

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? = Breeding status uncertain; the species may nest in the project region where suitable habitat exists.
A = Abundant: nearly always encountered, generally in moderate to large numbers in the habitat(s) indicated
C = Common: usually found in the habitat(s) indicated during the indicated season, but usually not in large numbers
U = Uncommon: occurs in small numbers, and is not always observed in the indicated habitat
R = Rare: may occur in the indicated habitat, but only in very small numbers
Ca = Casual: not of regular occurrence, although the project region is within the range of the species.
Habitat(s) typically used by the species:
Aq= Aquatic habitats: open water, stream and marsh
DR = Disturbed/ruderal: roadsides, agricultural fields, disked/weed-abated areas
Gr/OS = Grassland/oak savannah
OR = Open riverbed and bank
RW = Riparian woodland: cottonwood/willow forest & woodland, willow thicket and mule fat scrub
Sc = Scrub habitats: coastal sage scrub to low chaparral.

Plant Matrix

PLANT SPECIES OCCURRING OR POTENTIALLY OCCURRING ON OR ADJACENT TO NEWHALL RANCH

LYCOPODIAE

SELAGINELLACEAE - SPIKE-MOSS FAMILY

Selaginella bigelovii - Bigelow's spike-moss

EQUISETAE

EQUISETACEAE - HORSETAIL FAMILY

Equisetum hyemale – common scouring-rush
Equisetum laevigatum - smooth scouring-rush
Equisetum telmateia - giant horsetail

FILACEAE

AZOLLACEAE - MOSQUITO FERN FAMILY

Azolla c.f. filiculoides - duckweed fern

DENNSTAEDTIACEAE - BRAKEN FAMILY

Adiantum jordani - California maiden-hair
Pellaea andromedifolia - coffee fern
Pellaea mucronata var. *mucronata* - bird's-foot fern
Pentagramma triangularis - goldenback fern

POLYPODIACEAE - POLYPODY FAMILY

Polypodium californicum - California polypody

CONIFERAE

CUPRESSACEAE - CYPRESS FAMILY

* *Cedrus deodara* - Deodar cedar
Juniperus californica - California juniper

PINACEAE - PINE FAMILY

* *Pinus halepensis* - Aleppo pine
* *Pinus pinea* – stone pine

ANGIOSPERMAE (DICOTYLEDONES)

AIZOACEAE - FIG-MARIGOLD FAMILY

* *Aptenia cordifolia* - baby sun-rose
* *Carpobrotus* sp. - sea-fig

AMARANTHACEAE - AMARANTH FAMILY

* *Amaranthus albus* - tumbleweed
Amaranthus blitoides - prostrate amaranth
* *Amaranthus hybridus* - amaranth
Amaranthus palmeri – Palmer's amaranth
Amaranthus powellii – Powell's amaranth
* *Amaranthus retroflexus* - rough pigweed

ANACARDIACEAE - SUMAC FAMILY

Malosma laurina - laurel sumac
Rhus ovata - sugar-bush
Rhus trilobata - squaw bush
* *Schinus molle* - Peruvian pepper-tree
Toxicodendron diversilobum - poison-oak

APIACEAE - CARROT FAMILY

* *Anethum graveolens* - dill
Apiastrum angustifolium - wild celery
* *Apium graveolens* - celery
Berula erecta - cutleaf water-parsnip
Bowlesia incana – American Bowlesia
* *Conium maculatum* – poison hemlock
* *Coriandrum sativum* - cilantro
* *Daucus carota* – Queen Anne's lace
Daucus pusillus – rattlesnake weed
Lomatium utriculatum - common lomatium
Sanicula bipinnata – poison sanicle

APOCYNACEAE - DOGBANE FAMILY

Apocynum cannabinum - Indian hemp
* *Vinca major* - periwinkle

ASCLEPIADACEAE - MILKWEED FAMILY

Asclepias californica – California milkweed
Asclepias fascicularis - narrow-leaf milkweed

ASTERACEAE - SUNFLOWER FAMILY

Achillea millefolium – yarrow
Achyrachaena mollis – blow-wives
Acourtia microcephala – sacapellote
Agoseris grandiflora – large-flowered agoseris
Ambrosia acanthicarpa - annual burweed
Ambrosia confertifolia - weak-leaved burweed
Ambrosia psilostachya - western ragweed
Artemisia californica - coastal sagebrush
Artemisia douglasiana - California mugwort
Artemisia dracunculus - tarragon
Artemisia tridentata - Great Basin sagebrush
Baccharis douglasii - marsh baccharis
Baccharis emoryi – Emory's baccharis
Baccharis pilularis - coyote brush
Baccharis salicifolia - mule fat
Baccharis sarothroides - chaparral broom
Brickellia californica - California brickellbush
Brickellia nevinii - Nevin's brickellbush
* *Carduus pycnocephalus* - Italian thistle
* *Centaurea melitensis* - star thistle
Chaenactis glabriuscula - yellow pincushion
* *Chrysothamnus nauseosus* - rubber rabbitbrush
Cirsium occidentale var. *californicum*- California thistle
Cirsium occidentale var. *occidentale*- cobwebby thistle
* *Cirsium vulgare* - bull thistle
* *Cnicus benedictus* - blessed thistle
Conyza canadensis - horseweed
Conyza coulteri - Coulter's conyza
Coreopsis bigelovii – Bigelow's coreopsis
* *Coreopsis tinctoria* – calliopsis
Corethrogyne filaginifolia - virgate cudweed aster
* *Cotula coronopifolia* - African brass-buttons
Encelia actoni - Acton's encelia
Encelia californica - California bush sunflower
Encelia farinosa - brittlebush, incensio
Ericameria palmeri var. *pachylepis* - goldenbush
Ericameria pinifolia - pine-bush

Erigeron foliosus - leafy daisy
Eriophyllum confertiflorum - long-stem golden yarrow
Euthamia occidentalis - western goldenrod
Filago californica - California fluffweed
* *Filago gallica* - narrow-leaf filago
* *Gazania linearis* - gazania
Gnaphalium bicolor - bicolor cudweed
Gnaphalium californicum - California everlasting
Gnaphalium canescens ssp. *microcephalum* - white everlasting
Gnaphalium leucocephalum – Sonora everlasting
Gnaphalium luteo-album - white cudweed
Gnaphalium sp. *nova* - everlasting
Gnaphalium palustre - lowland cudweed
Hazardia squarrosa ssp. *grindelioides* - saw-toothed goldenbush
Helianthus annuus - common sunflower
Helianthus nuttallii c.f. ssp. *parishii* - Los Angeles sunflower
Hemizonia fasciculata - fascicled tarweed
Hemizonia kelloggii – Kellogg's tarweed
Heterotheca grandiflora - telegraph weed
Heterotheca sessiliflora - golden aster
Isocoma menziesii - goldenbush
Iva axillaris - poverty weed
* *Lactuca saligna* – willowleaf lettuce
* *Lactuca serriola* - prickly lettuce
Lagophylla ramosissima – common hareleaf
Lasthenia californica - coast goldfields
Lepidospartum squamatum - scale-broom
Lessingia filaginifolia – California aster
Lessingia glandulifera – lessingia
Malacothrix saxatilis - cliff malacothrix
* *Matricaria matricarioides* - pineapple weed
Micropus californicus - slender cottonweed
Pluchea odorata - marsh-fleabane
Pluchea sericea - arrow weed
* *Pulicaria paludosa* - Spanish sunflower
Rafinesquia californica - California chicory
Senecio californicus – California butterweed
Senecio flaccidus var. *douglasii* - butterweed
* *Senecio vulgaris* - common groundsel
Silybum marianum - milk thistle

* *Sonchus asper* - prickly sow-thistle
* *Sonchus oleraceus* - common sow-thistle
Stebbinoseris heterocarpa [*Microseris heterocarpa*] – brown puffs
Stephanomeria exigua - small wreathplant
Stephanomeria pauciflora - wire-lettuce
Stephanomeria virgata - twiggy wreathplant
Stylocline gnaphaloides - everlasting nest-straw
Uropappus lindleyi [*Microseris lindleyi*] – silver puffs
Wyethia ovata - mule ears
Xanthium spinosum - spiny cocklebur
Xanthium strumarium – cocklebur

BETULACEAE – BIRCH FAMILY
Alnus rhombifolia – white alder

BORAGINACEAE - BORAGE FAMILY
Amsinckia menziesii var. *intermedia* - yellow fiddleneck
Amsinckia menziesii var. *menziesii* - yellow fiddleneck
Amsinckia tessellata – devil's lettuce
Cryptantha sp. - forget-me-not
Cryptantha intermedia - common forget-me-not
Cryptantha micrantha – redroot cryptantha
Cryptantha microstachys – tejon cryptantha
Cryptantha muricata – prickly cryptantha
Heliotropium curassavicum - wild heliotrope
Pectocarya linearis - slender pectocarya
Pectocarya penincillata - pectocarya
Pectocarya setosa - pectocarya
Plagiobothrys arizonicus - popcorn flower
Plagiobothrys canescens - rusty popcorn flower
Plagiobothrys collinus - California popcorn flower
Plagiobothrys fulvus - *common popcorn flower*

BRASSICACEAE - MUSTARD FAMILY
Athysanus pusillus – dwarf athysanus
* *Brassica nigra* - black mustard
* *Capsella bursa-pastoris* - shepard's purse
Caulanthus lasiophyllus – California mustard
Descurainia pinnata ssp. *halictorum* – tansy mustard
* *Hirschfeldia incana* - short-podded mustard

Lepidium lasiocarpum - peppergrass
* *Lepidium latifolium* - peppergrass
Lepidium virginicum - wild peppergrass
* *Lobularia maritime* – sweet-alyssum
* *Raphanus sativus* - wild radish
* *Rorippa nasturtium-aquaticum* - water cress
* *Sisymbrium altissimum* - tumble mustard
* *Sisymbrium irio* - London rocket
* *Sisymbrium officinale* - hedge mustard
* *Sisymbrium orientale* - Oriental mustard
Stanleya pinnata var. *pinnata*– Prince's plume
Thysanocarpus curvipes – fringepod
Tropidocarpum gracile – slender dobie-pod

CACTACEAE - CACTUS FAMILY
* *Cereus peruvianus* - Peruvian apple cactus
Opuntia basilaris var. *ramosa* – beaver-tail cactus
Opuntia californica var. *parkeri* - cane cholla
Opuntia littoralis - coastal prickly-pear
Opuntia X vaseyi - prickly-pear cactus
* *Trichocereus spachianus* - golden torch cactus

CAPPARACEAE - CAPER FAMILY
Isomeris arborea - bladderpod

CAPRIFOLIACEAE - HONEYSUCKLE FAMILY

Lonicera subspicata - southern honeysuckle
Sambucus mexicana - Mexican elderberry
Symphoricarpos sp. - snowberry
Symphoricarpos c.f. mollis - spreading snowberry

CARYOPHYLLACEAE - PINK FAMILY

* *Cerastium glomeratum* - sticky mouse-ear
* *Herniaria cinerea* - gray herniaria
Loeflingia squarrosa - no common name
* *Silene gallica* - common catchfly
Spergularia sp. - stickwort, starwort
* *Spergularia rubra* - sand-spurrey
* *Spergularia c.f. villosa* - villous sand-spurrey
* *Stellaria media* - common chickweed

CASURINACEAE – SHEET OAK FAMILY

* *Casuarina cunninghamiana* - Austrailian Pine

CHENOPODIACEAE - GOOSEFOOT FAMILY

Atriplex canescens - four-winged saltbush
* *Atriplex heterosperma* - weedy orache
Atriplex lentiformis- big saltbush, quail brush
* *Atriplex rosea* - tumbling oracle
* *Atriplex semibaccata* - Australian saltbush
Atriplex serenana var. *serenana* - bractscale
Atriplex suberecta - Australian saltbush
Atriplex triangularis – spearscale
* *Bassia hyssopifolia* - five-hooked bassia
* *Beta vulgaris* – garden beet
* *Chenopodium album* - lamb's-quarters
* *Chenopodium ambrosioides* - Mexican tea
Chenopodium berlandieri - pitseed goosefoot
* *Chenopodium botrys* - goosefoot
Chenopodium californicum - California goosefoot
* *Chenopodium murale* - nettle-leaved goosefoot
Chenopodium rubrum - red goosefoot
* *Salsola tragus* - Russian-thistle
* *Spinacia oleracea* – spinach

CONVOLVULACEAE - MORNING-GLORY FAMILY

Calystegia macrostegia ssp. *cyclostegia* – morning-glory
Calystegia peirsonii - Peirson's morning-glory
* Convolvulus arvensis - bindweed

CRASSULACEAE - STONECROP FAMILY

Crassula connata - dwarf stonecrop
Dudleya cymosa - unidentified dudleya
Dudleya lanceolata - lanceleaf dudleya

CUCURBITACEAE - GOURD FAMILY

Cucurbita foetidissima - coyote-melon, calabazilla
Marah macrocarpus - wild cucumber

CUSCUTACEAE - DODDER FAMILY

Cuscuta californica - California dodder
Cuscuta pentagona – five-angled dodder
Cuscuta subinclusa – canyon dodder

DATISCACEAE - DASTICA FAMILY

Dastica glomerata - Durango root

ERICACEAE - HEATH FAMILY

Arctostaphylos glauca - bigberry manzanita

EUPHORBIACEAE - SPURGE FAMILY

Chamaesyce albomarginata - rattlesnake spurge
* *Chamaesyce maculata* – spotted spurge
Chamaesyce polycarpa - small-seed sand mat
Chamaesyce serpyllifolia – thyme-leafed spurge
Croton californicus - California croton
Eremocarpus setigerus - doveweed

Euphorbia spathulata - reticulate-seed spurge
* *Ricinus communis* - castor-bean
Stillingia linearifolia - linear-leaved stillingia

FABACEAE - PEA FAMILY

* *Acacia baileyana* - golden wattle
Astragalus didymocarpus – white dwarf locoweed
Astragalus gambelianus – Gambel's locoweed
Astragalus trichopodus - Santa Barbara locoweed
Glycyrrhiza lepidota - wild licorice
Lathyrus laetiflorus - wild sweet pea
Lathyrus vestitus - wild pea
Lotus corniculatus - bird's-foot lotus
Lotus hamatus – grab lotus
Lotus humistratus - lotus
Lotus purshianus - Spanish-clover
Lotus salsuginosus - coastal lotus
Lotus scoparius var. *scoparius* - deerweed
Lotus strigosus - strigose deerweed
Lupinus bicolor - Lindley's annual lupine
Lupinus excubitus – Mountain Springs bush lupine
Lupinus excubitus var. *hallii* - grape soda lupine
Lupinus hirsutissimus - stinging lupine
Lupinus microcarpus var. *densiflorus* - chick lupine
Lupinus microcarpus var. *microcarpus* - chick lupine
Lupinus sparsiflorus - Coulter's lupine
Lupinus succulentis - arroyo lupine
Lupinus truncatus - collar lupine
* *Medicago polymorpha* - California burclover
* *Medicago polymorpha* var. *brevispina* - short-spined California burclover
* *Medicago sativa* - alfalfa
* *Melilotus alba* - white sweet-clover
* *Melilotus indica* - yellow sweet-clover
* *Robinia pseudoacacia* - black locust
Trifolium sp. – clover
Trifolium albopurpureum – rancheria clover
Trifolium ciliolatum- tree clover
* *Trifolium fragiferum* - strawberry clover

Trifolium gracilentum – pin-point clover
* *Trifolium hirtum* - rose clover
Trifolium microcephalum – maiden clover
* *Trifolium repens* - white clover
Trifolium willdenovii – valley clover
Vicia hassei – Hesse's vetch
* *Vicia villosa* ssp. *villosa* – winter vetch

FAGACEAE - BEECH FAMILY

Quercus agrifolia - coast live oak
Quercus berberidifolia - scrub oak
Quercus douglasii - blue oak
Quercus lobata - valley oak

GERANIACEAE - GERANIUM FAMILY

* *Erodium brachycarpum* – shortfruit stork's bill
* *Erodium botrys* – long-beaked filaree
* *Erodium cicutarium* - red-stemmed filaree
* *Erodium moschatum* – white-stemmed filaree

GROSSULARIACEAE - CURRANT FAMILY

Ribes aureum - golden currant
Ribes malvaceum - chaparral currant

HYDROPHYLLACEAE - WATERLEAF FAMILY

Emmenanthe penduliflora - whispering bells
Eriodictyon crassifolium var. *nigrescens* - yerba santa
Eucrypta chrysanthemifolia - common eucrypta
Nemophila menziesii – baby blue-eyes
Nemophila parviflora var. *quercifolia* – oak-leaved nemophila
Phacelia cicutaria - caterpillar phacelia
Phacelia cicutaria var. *hispida* – caterpillar phacelia
Phacelia distans - blue fiddleneck
Phacelia imbricata ssp. *imbricata* - imbricate phacelia
Phacelia minor - wild canterbury-bell
Phacelia ramosissima - shrubby phacelia

JUGLANDACEAE - WALNUT FAMILY

Juglans californica - southern California black walnut

LAMIACEAE - MINT FAMILY

* *Marrubium vulgare* - horehound
Mentha citrata – orange mint
Salvia apiana - white sage
Salvia columbariae - chia
Salvia leucophylla - purple sage
Salvia mellifera - black sage
Stachys ajugoides – bugle hedge-nettle
Stachys ajugoides var. *rigida* - rigid hedge-nettle
Stachys albens - white hedge-nettle
Trichostema lanceolatum - vinegar weed

LAURACEAE - LAUREL FAMILY
Umbellularia californica - California laurel

LOASACEAE - STICK-LEAF FAMILY
Mentzelia sp. – blazing star
Mentzelia laevicaulis - blazing star
Mentzelia micrantha - small-flowered stick-leaf

LYTHRACEAE - LOOSESTRIFE FAMILY
Lythrum californicum - California loosestrife

MALVACEAE - MALLOW FAMILY
Malacothamnus fasciculatus ssp. *laxiflorus* – chaparral bush mallow
Malacothamnus fremontii – bush mallow
Malacothamnus marrubioides - bush mallow
* *Malva neglecta* - common mallow
* *Malva parviflora* - cheeseweed

MELIACEAE - MAHOGANY FAMILY
* *Melia azedarach* - China berry

MORACEAE - FIG FAMILY

* *Ficus carica* – edible fig

MYRTACEAE - MYRTLE FAMILY

* *Eucalyptus* sp. - eucalyptus
* *Eucalyptus camaldulensis* – red gum
* *Eucalyptus globulus* - blue gum
* *Eucalyptus leucoxylon* - white ironbark
* *Eucalyptus polyanthemos* – silver dollar gum
* *Eucalyptus sideroxylon* - red ironbark

NYCTAGINACEAE - FOUR O'CLOCK FAMILY

Mirabilis laevis var. *crassifolia* [*M. californica*]- California wishbone-bush

OLEACEAE - OLIVE FAMILY

Fraxinus dipetala - California ash
* *Fraxinus uhdei* – tropical ash
Fraxinus velutina – velvet ash
* *Ligustrum lucidum* - glossy privet
* *Olea europaea* - mission olive

ONAGRACEAE - EVENING-PRIMROSE FAMILY

Camissonia bistorta – southern sun cup
Camissonia boothii - sun cup
Camissonia boothii ssp. *decorticans* – shredding evening primrose
Camissonia californica - mustard primrose
Camissonia hirtella - sun cup
Camissonia strigulosa - sun cup
Clarkia purpurea - winecup clarkia
Clarkia speciosa - clarkia
Clarkia unguiculata - elegant clarkia
Epilobium brachycarpum - willow herb
Epilobium canum ssp. *canum* - California fuchsia
Epilobium ciliatum - California cottonweed
Ludwigia peploides - yellow waterweed

Ludwigia repens - water primrose
Oenothera elata - evening primrose
* *Oenothera laciniata* - evening primrose

OROBANCHACEAE - BROOM-RAPE FAMILY
Orobanche parishii ssp. *parishii* - broom-rape

PAEONIACEAE - PEONY FAMILY
Paeonia californica - California peony

PAPAVERACEAE - POPPY FAMILY
Argemone corymbosa – prickly poppy
Eschscholzia californica - California poppy
Platystemon californicus – California creamcups

PLANTAGINACEAE - PLANTAIN FAMILY
Plantago erecta - dot-seed plantain
* *Plantago indica* - plantain
* *Plantago lanceolata* - English plantain
* *Plantago major* - common plantain

PLATANACEAE - SYCAMORE FAMILY
Platanus racemosa - western sycamore

POLEMONIACEAE - PHLOX FAMILY
Allophyllum divaricatum - purple false gillyflower
Allophyllum glutinosum – sticky false gillyflower
Eriastrum densifolium – woollystar
Eriastrum densifolium ssp. *elongatum* - elongate eriastrum
Eriastrum densifolium ssp. *mohavense* - Mohave eriastrum
Eriastrum sapphirinum - sapphire eriastrum
Gilia angelensis - angel gilia
Gilia capitata – globe gilia
Leptodactylon californicum - prickly phlox
Linanthus androsaceus – common linanthus

Linanthus pygmaeus - linanthus
Navarretia atractyloides - holly-leaf skunkweed
Phlox gracilis – slender phlox

POLYGONACEAE - BUCKWHEAT FAMILY

Chorizanthe parryi var. *fernandina* - San Fernando Valley spineflower
Chorizanthe staticoides - turkish rugging
Eriogonum angulosum - angle-stem buckwheat
Eriogonum baileyi – Bailey's buckwheat
Eriogonum brachyanthum – short-flowered buckwheat
Eriogonum elongatum - long-stemmed buckwheat
Eriogonum fasciculatum ssp. *foliolosum* - California buckwheat
Eriogonum fasciculatum ssp. *polifolium* - California buckwheat
Eriogonum gracile var. gracile - slender woolly buckwheat
Eriogonum gracillimum – rose and white buckwheat
Eriogonum maculatum – spotted buckwheat
Eriogonum c.f. viridescens - buckwheat
Lastarriaea coriacea - lastarriaea
* *Polygonum arenastrum* - common knotweed
* *Polygonum argyrocoleon* - smartweed
Polygonum lapathifolium - willow weed
Polygonum punctatum - perennial smartweed
Pterostegia drymarioides - pterostegia
* *Rumex conglomeratus* - whorled dock
* *Rumex crispus* - curly dock
Rumex hymenosepalus - wild rhubarb
Rumex maritimus – golden dock
Rumex obtusifolius - dock
Rumex salicifolius - willow dock

PORTULACACEAE - PURSLANE FAMILY

Calandrinia ciliata - redmaids
Claytonia parviflora - small-leaved montia
Claytonia perfoliata – miner's lettuce
* *Portulaca oleracea* - common purslane

RANUNUCULACEAE - BUTTERCUP FAMILY

Clematis ligusticifolia - yerba de chiva
Delphinium parryi ssp. *parryi* – Parry's larkspur

RHAMNACEAE - BUCKTHORN FAMILY

Ceanothus crassifolius - hoary-leaved ceanothus
Ceanothus tomentosus - woolyleaf ceanothus
Rhamnus crocea - redberry
Rhamnus ilicifolia - holly-leaf redberry

ROSACEAE - ROSE FAMILY

Adenostoma fasciculatum – chamise
Cercocarpus betuloides – mountain-mahogany
Cercocarpus betuloides var. *betuloides* - birch-leaf mountain-mahogany
Cercocarpus betuloides var. *blancheae* - island mountain-mahogany
Heteromeles arbutifolia - toyon
Prunus ilicifolia - holly-leaf cherry
Rosa californica - California rose
Rubus ursinus - California blackberry
* *Sangwisorba minor* – garden burnet

RUBIACEAE - MADDER FAMILY

Galium angustifolium - narrow-leaved bedstraw
* *Galium aparine* - goose grass
Galium nuttallii ssp. *nuttallii* – San Diego bedstraw
Galium porrigens - climbing bedstraw

SALICACEAE - WILLOW FAMILY

Populus fremontii - Fremont's cottonwood
Salix exigua - narrow-leaved willow
Salix gooddingii - black willow
Salix laevigata - red willow
Salix lasiolepis - arroyo willow
Salix lucida ssp. *lasiandra* - golden willow

SAURURACEAE - LIZARD'S-TAIL FAMILY

Anemopsis californica - yerba mansa

SCROPHULARIACEAE - FIGWORT FAMILY

Antirrhinum coulterianum - white snapdragon
Antirrhinum multiflorum – withered snapdragon
Castilleja affinis - coast paintbrush
Castilleja densiflora - dense-flowered owl's-clover
Castilleja exserta - common owl's-clover
Castilleja foliolosa - woolly Indian paintbrush
Collinsia heterophylla – purple Chinese houses
Cordylanthus rigidus – bird’s beak
Keckiella cordifolia - heart-leaf penstemon
Linaria canadensis - toadflax
Mimulus aurantiacus - bush monkeyflower
Mimulus aurantiacus var. *pubescens* - bush monkeyflower
Mimulus guttatus - seep monkeyflower
Mimulus pilosus – downy monkeyflower
Penstemon centranthifolius - scarlet bugler
* *Verbascum thapsus* - woolly mullein
* *Verbascum virgatum* - wand mullein
* *Veronica anagallis-aquatica* - water speedwell

SIMAROUBACEAE - QUASSIA FAMILY

* *Ailanthus altissima* - tree of heaven

SOLANACEAE - NIGHTSHADE FAMILY

Datura wrightii - western jimsonweed
* *Nicotiana glauca* - tree tobacco
Nicotiana quadrivalvis – Indian tobacco
* *Solanum americanum* - small-flowered nightshade
Solanum douglasii - white nightshade
* *Solanum eleagnifolium* - silver leaf horse-nettle
* *Solanum sarrachoides* - hairy nightshade
Solanum xanti - chaparral nightshade

TAMARICACEAE - TAMARISK FAMILY

* *Tamarix* sp. – tamarisk

* *Tamarix ramoissima* - tamarisk

ULMACEAE - ELM FAMILY

* *Ulmus pumila* - Siberian elm

URTICACEAE - NETTLE FAMILY

Hesperocnide tenella – western nettle

Parietaria hespera – western pellitory

Urtica dioica - giant creek nettle

* *Urtica urens* - dwarf nettle

VERBENACEAE - VERVAIN FAMILY

Verbena lasiostachys - western verbena

VIOLACEAE – VIOLET FAMILY

Viola pedunculata – Johnny jump-ups

VISCACEAE - MISTLETOE FAMILY

Phoradendron macrophyllum - big leaf mistletoe

Phoradendron villosum - oak mistletoe

VITACEAE - GRAPE FAMILY

Parthenocissus vitacea - woodbine, Virginia creeper

Vitis girdiana - desert wild grape

ZYGOPHYLLACEAE - CALTROP FAMILY

* *Tribulus terrestris* - puncture vine

ANGIOSPERMAE (MONOCOTYLEDONES)

ARECACEAE - PALM FAMILY

* *Washingtonia robusta* - Mexican fan palm

CYPERACEAE - SEDGE FAMILY

Carex alma – sturdy sedge

Carex praegracilis – clustered field sedge

Carex sp. - sedge

Cyperus eragrostis - tall cyperus

Cyperus esculentus - yellow nut-grass
* *Cyperus involucratus* - nutsedge
Cyperus odoratus - coarse cyperus
Eleocharis montevidensis - slender creeping spike-rush
Eleocharis parishii – Parish's spikerush
Eleocharis rostellata – beaked spikerush
Scirpus acutus - hard-stemmed bulrush
Scirpus americanus - winged three-square
Scirpus maritimus – alkali bulrush
Scirpus microcarpus - bulrush
Scirpus robustus - Pacific coast bulrush

JUNCACEAE - RUSH FAMILY

Juncus sp. - rush
Juncus acutus ssp. *leopoldii* – southwestern spiny rush
Juncus balticus - wire rush
Juncus bufonius - toad rush
Juncus longistylis – rush
Juncus mexicanus – Mexican rush
Juncus rugulosus - wrinkled rush
Juncus textilis - Indian rush
Juncus torreyi – rush
Juncus triformis - Yosemite dwarf rush
Juncus xiphioides - iris-leaved rush

LEMNACEAE - DUCKWEED FAMILY

Lemna miniscula - duckweed
Lemna valdiviana - duckweed

LILIACEAE - LILY FAMILY

* *Allium cepa* - onion
Allium porrum - onion
* *Amaryllis bella-donna* - naked lady
* *Asparagus officinalis* – asparagus
Bloomeria crocea – common goldenstar
Brodiaea terrestris ssp. *kernensis* – dwarf brodiaea
Calochortus clavatus var. *gracilis*- slender mariposa lily
Calochortus venustus - mariposa lily

Dichelostemma capitatum - blue dicks
Muilla maritima - common muilla
Yucca whipplei – Our Lord's candle

POACEAE - GRASS FAMILY

Achnatherum coronatum - giant needlegrass
* *Agrostis* sp. - bentgrass
* *Agrostis viridis* - water bent
* *Arundo donax* - giant reed
* *Avena barbata* - slender oat
* *Avena fatua* - wild oat
Avena sativa – cultivated oat
Bromus catharticus - California brome
Bromus catharticus var. *catharticus* - California brome
* *Bromus diandrus* - ripgut grass
* *Bromus hordeaceus* - soft chess
* *Bromus madritensis* ssp. *rubens* - foxtail chess
* *Bromus sterilis* – sterile brome
* *Bromus tectorum* - cheat grass
* *Cortaderia jubata* - pampas grass
* *Crypsis schoenoides* - prickle grass
* *Cynodon dactylon* - Bermuda grass
* *Digitaria sanguinalis* - hairy crabgrass
Distichlis spicata - salt grass
* *Echinochloa colonum* - jungle-rice
Echinochloa crus-galli - barnyard grass
* *Eleusine indica* – goose grass
Elymus glaucus - western wild-rye
Elymus multisetus – big squirreltail
Eragrostis mexicana - lovegrass
* *Festuca arundinacea* - tall fescue
* *Hordeum marinum* - Mediterranean barley
* *Hordeum murinum* - glaucous foxtail barley
* *Lamarckia aurea* - goldentop
* *Leptochloa uninerva* - Mexican sprangletop
Leymus condensatus - giant ryegrass
Leymus triticoides - beardless wild rye
Leptichloa uninervia - Mexican sprangletop
* *Lolium multiflorum* – Italian ryegrass
* *Lolium perenne* - perennial ryegrass

Melica imperfecta - California melic
Muhlenbergia asperifolia – scratch-grass
Muhlenbergia microsperma - littleseed muhly
Nassella cernua – nodding needlegrass
Nassella lepida – foothill needlegrass
Nassella pulchra – purple needlegrass
Panicum capillare – western witchgrass
* *Panicum miliaceum* – broom corn millet
* *Parapholis incurve* – sickle grass
Paspalum distichum – knotgrass
* *Phalaris aquatica* – Harding grass
* *Phalaris minor* - Mediterranean canary grass
* *Piptatherum miliaceum* - smilo grass
* *Poa annua* - annual bluegrass
Poa secunda - Malpais bluegrass
* *Polypogon interruptus* - ditch beard grass
* *Polypogon monspeliensis* - rabbit's-foot grass
Schismus barbatus – abumashi
Sorghum bicolor – sorghum
Sorghum halepense – Johnsongrass
Sporobolus airoides – alkali scation
* *Triticum aestivum* – cultivated wheat
Vulpia microstachys - fescue
* *Vulpia myuros* - rattail fescue
Vulpia octoflora - six-weeks fescue

POTAMOGETONACEAE - PONDWEED FAMILY

Potamogeton foliosus - leafy pondweed

TYPHACEAE - CATTAIL FAMILY

Typha domingensis - slender cattail
Typha latifolia - broad-leaved cattail

* signifies introduced (non-native) species

APPENDIX E

Technical Reports

PACE, Landmark Village Flood Technical Report

Landmark Village

FLOOD
TECHNICAL REPORT

June 2005

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List of Acronyms

ACOE	Army Corps of Engineers
AG	Agricultural and Other Development Uses
AD	Agricultural Drain
AS	Alluvial Scrub
CDFG	California Department of Fish and Game
CRW	Southern California Cottonwood/Willow Riparian Forest
CRWU	Southern California Cottonwood/Willow Upland Forest
CWA	Federal Clean Water Act
CSS	Costal Sage Scrub
ES	Elderberry Scrub
FEMA	Federal Emergency Management Agency
G	Grassland
G/D	Disturbed Grassland
GBSR	Riparian Great Basin Scrub
GR	Riparian Grassland
LACDPW	Los Angeles County Department of Public Works
LOW	Live Oak Woodland
LOW/MC	Like Oak Woodland/Mixed Chaparral
MC	Mixed Chaparral
MFS	Mule Fat Scrub
MFS/D	Disturbed Mule Fat Scrub
RWQCBLAR	Regional Water Quality Control Board, Los Angeles Region
SMFS	Successional Mule Fat Scrub
SS	Scalebroom Scrub
SWRCB	State Water Resources Control Board
WRP	Water Reclamation Plant
WRW	Southern Willow Riparian Woodland
WS	Southern Willow Scrub
N/C	Not Coded

1 Introduction

This technical report is submitted in connection with the Landmark Village tract map project and other related improvements, including flood and erosion control in and adjacent to the Santa Clara River, various drainage improvements and construction of the Long Canyon Road Bridge ("the Project"). The Project would implement a portion of the approved Newhall Ranch Specific Plan, located in northern Los Angeles County, California. The approved Specific Plan was the subject of extensive environmental review in the previously certified Newhall Ranch EIR (March 1999) (State Clearinghouse No. 1995011015) and the related Revised Additional Analysis (May 2003). The Project was assessed at a program-level environmental analysis for the Specific Plan, and at a project-level environmental analysis for the Specific Plan's Water Reclamation Plant (WRP).

As part of that prior review, the previously certified Newhall Ranch EIR (Section 4.2, Flood) and the certified Revised Additional Analysis (Section 2.3, Floodplain Modifications) assessed the hydrology and hydraulics of the Santa Clara River corridor as a result of proposed floodplain modifications associated with build-out of the entire Newhall Ranch Specific Plan. In addition to evaluating the hydrological impacts of the Newhall Ranch Specific Plan, another objective of the analysis was to determine if predicted Project improvements (*i.e.*, "floodplain modifications") would cause significant impacts to the nature, amount and location of the aquatic/riparian habitats in the River corridor, the Specific Plan site, and the downstream reaches in Ventura County. The floodplain modifications included three bridge crossings over the River, buried soil cement bank protection placement along portions of the banks in the River corridor of the Specific Plan, and removal of mostly agricultural acreage from the floodplain by raising the land areas and installing elevated bank protection. The prior analysis, referenced above, evaluated impacts on flows, floodplain and habitat areas, velocities, water depths, and sediment scouring/deposition patterns for a range of storm flows within the River (2-year through 100-year flood flows). The prior analysis determined that the proposed Specific Plan improvements would alter velocities in the River. However, the impacts were only expected during infrequent flood events (*e.g.*, 50-year and 100-year flood events), and those impacts were only anticipated to reach the buried banks. The prior analysis (Section 2.3) also found that the Specific Plan would cause an increase in water velocities, water depth, changes in sediment transport, and changes in the flooded areas. However, these hydraulic effects were found to be minor in magnitude and event. These effects were also found to be insufficient to alter the amount, location and nature of aquatic and riparian habitats in the Specific Plan area and downstream in Ventura County. The prior analysis (Section 2.3) further determined that, under the Specific Plan, the River would still retain sufficient width to allow natural fluvial processes to continue. As a result, the prior analysis (Section 2.3) concluded that the mosaic of habitats in the River that support various sensitive species would be maintained, and the population of the species within and adjacent to the River corridor would not be significantly affected.

Because of the prior environmental analysis (EIR, Section 4.2 and Revised Additional Analysis, Section 2.3), this report will focus on the analysis of the Project's specific improvements, both on-site and in and adjacent to the River corridor. The analysis in this report is facilitated by the project-specific planning conducted for the Project's tentative subdivision map, which is the mechanism used to implement portions of the

approved Newhall Ranch Specific Plan. This report will review project-specific design plans, analyze those plans against existing conditions, confirm consistency with prior design assumptions and the impact analysis provided in the previously certified EIR, inclusive of the Revised Additional Analysis, and, where necessary, update the previous analysis to reflect proposed Project conditions.

1.1 Project Description

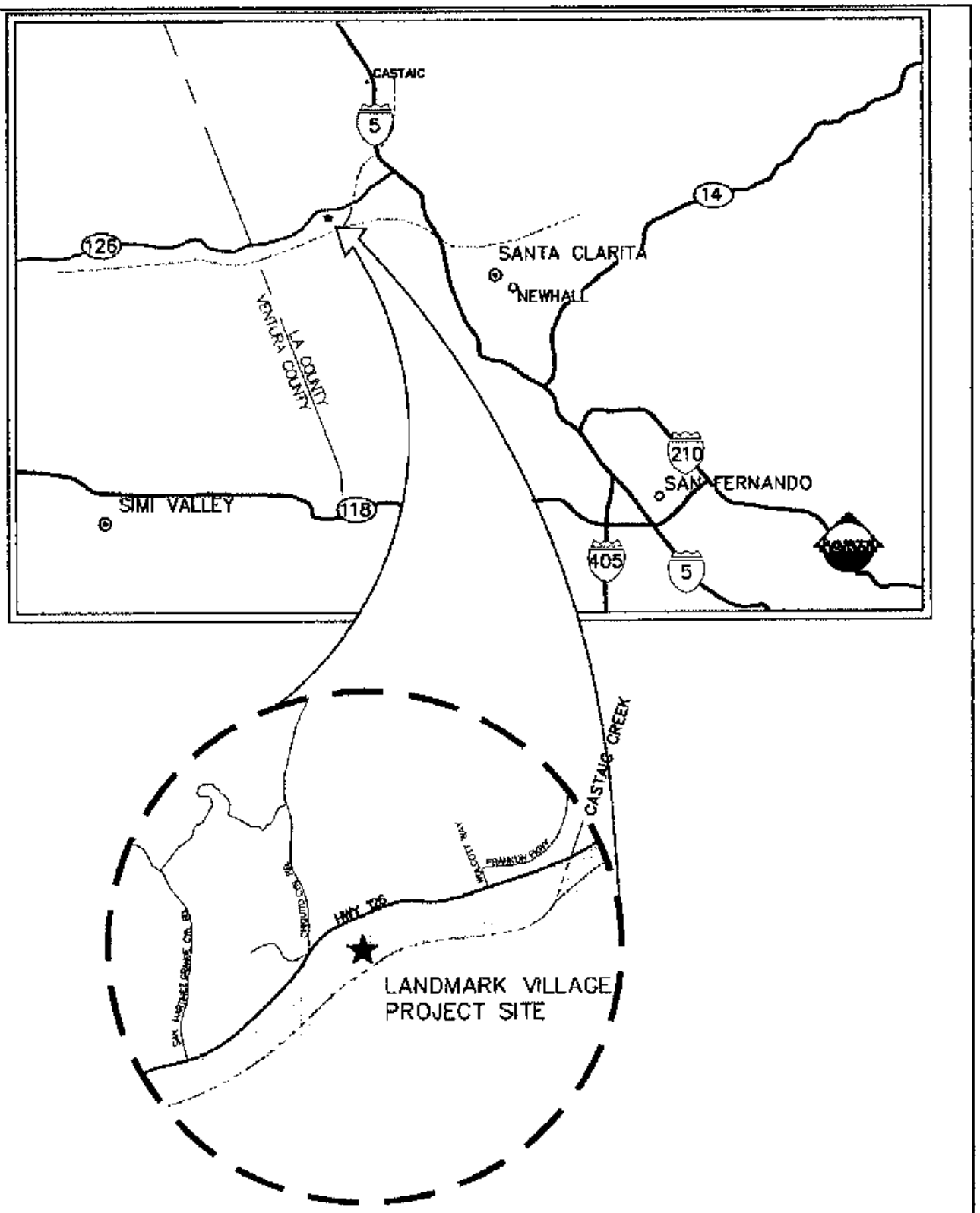
1.1.1 Project Site

The Project lies within a contributing drainage of 996 acres of the 1,634 square-mile Santa Clara River basin watershed (Psomas, Landmark Village Drainage Concept Report). The River banks form the southern boundary of the Project site, and SR-126 forms the northern boundary of the Project site. The Project site is located east of the Chiquito Creek tributary and west of the River's confluence with Castaic Creek on the north bank of the River (Figure 1.1).

Tributaries drain into or adjacent to the Project site, including Chiquito Creek on the River's north bank (RS 22195), Long Canyon Creek on the south bank (RS 22790), and Castaic Creek, which enters the River upstream of the Project site (RS 31585) (Figure 1.2). The Chiquito Creek drainage is approximately 4.8 square miles, with a stream length of approximately 22,000 feet. The Long Canyon Creek drainage area is approximately 1.5 square miles, with a stream length of approximately 1,000 feet. The Castaic Creek watershed, the largest of the tributary watersheds, is approximately 16.8 square miles below the dam. The Project is bounded by Castaic Creek to the east and Chiquito Creek to the west. Long Canyon Creek is downstream of the Project site to the west (Figure 1.2).

Other tributaries adjacent to the Project site include San Martinez Grande Canyon Creek (RS 17510), and Potrero Canyon Creek (RS 15335), as well as drainage from the adjacent landfill (RS 24115). One unnamed jurisdictional drainage is located on the Project site and drains the offsite landfill (Figure 1.2).

The Project site, which consists of approximately 291 acres, is currently used for agricultural production, and is within the boundaries of the approved Newhall Ranch Specific Plan. The Specific Plan describes the type and intensity of development proposed for the Project site. The Project consists of 1,136 multi-family units, 308 single-family detached units, and a maximum of 1,033,000 square feet of retail/commercial uses. The Project also includes an elementary school, a community park, private recreational facilities, and various trail and road improvements. Site preparation will include a cut and fill grading operation with fill being imported to the site from a location south of the site within the Specific Plan area. The Project also includes buried soil cement bank protection on both the north and south banks of the River, erosion protection, and construction of Long Canyon Road Bridge over the River. The bridge would include bridge abutments, piers, and soil cement on the north and



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LANDMARK VILLAGE

VICINITY MAP

FIGURE 1.1

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FIGURE 1.2

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SANTA CLARITA CA

JURISDICITIONAL LIMITS

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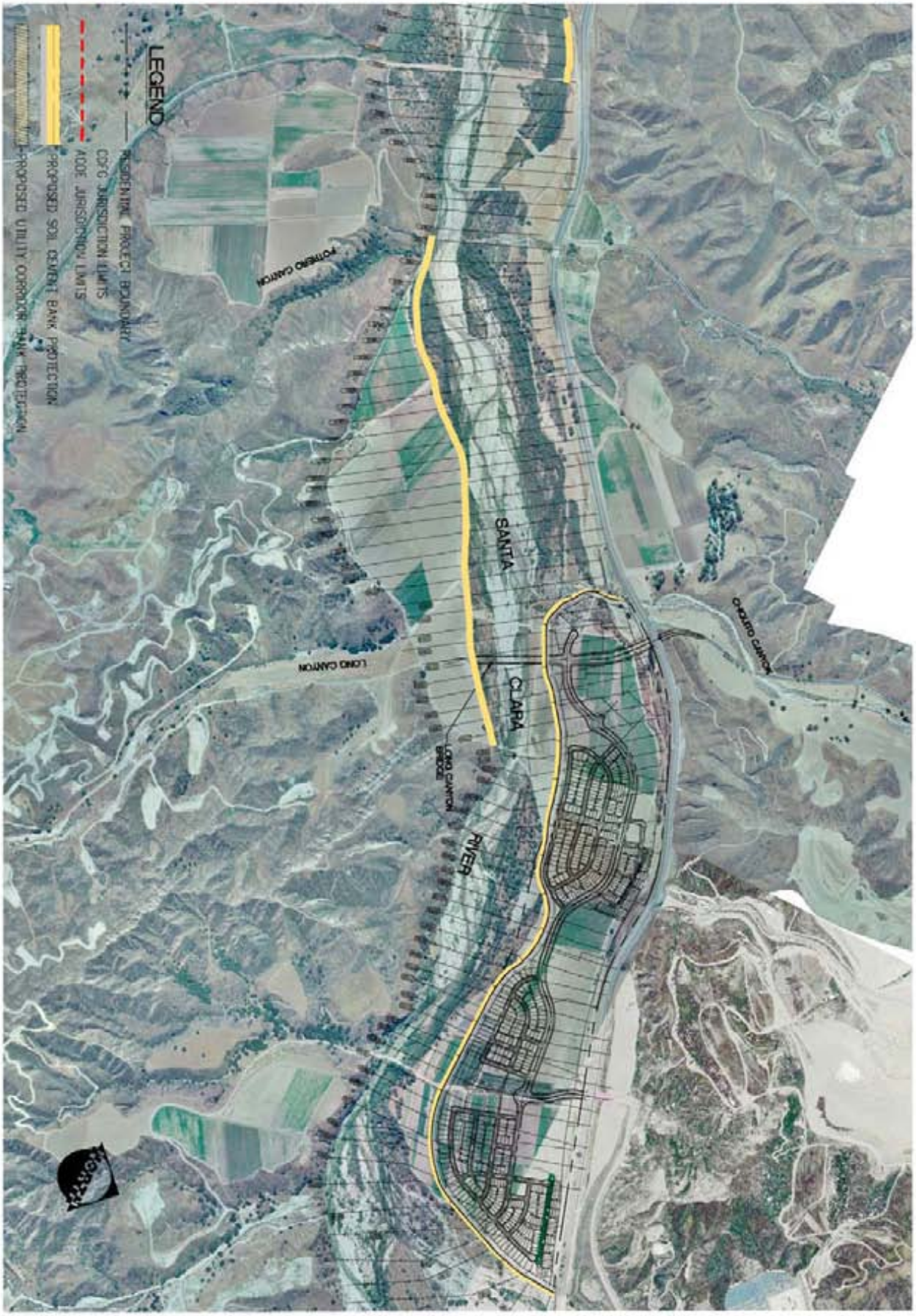

FIGURE 1.3

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SANTA CLARITA CA

PROPOSED BANK

south side of the bridge (Figure 1.3). These and other proposed Project-related drainage features are described below in Sections 1.1.2 and 1.1.3.

1.1.2 Proposed Drainage Improvements – Project and Santa Clara River

The proposed improvements on the Project site that would provide flood and erosion control and that would occur in and adjacent to the River and its tributaries include:

- Bank stabilization;
- Various stormwater drainage outlet structures;
- Construction of the Long Canyon Road Bridge and related bridge abutments and piers; and
- SR-126/Castaic Creek Bridge improvements adjacent to Castaic Creek.

Bank stabilization is comprised of soil cement, rip-rap and reinforced concrete. Additionally, a form of biotech stabilization, turf reinforcement mats (TRM's), would be utilized along portions of the utility corridor. Improvement locations are shown in Figure 1.4. Soil cement may be buried or exposed, and rip-rap may be grouted or not grouted. Flood control improvements evaluated in this report are similar to those identified in the previously approved Newhall Ranch Specific Plan. Minor deviations from the Specific Plan were considered and evaluated in this report. These are highlighted in the text below.

The Project's drainage facilities that would occur in or adjacent to the River corridor, including Castaic Creek, include:

1. *Stormwater Drainage Outlets/Energy Dissipaters*
   a. To reduce storm flow velocities and prevent erosion at stormwater discharge points into the River, energy dissipaters consisting of either rip-rap or other larger reinforced concrete standard impact-type energy dissipaters would be constructed at storm system outlets into the River. These energy dissipaters would slow the rate of flow of runoff into the River to prevent erosion of the stream channel. Additional dissipaters would be located at the outlet of Chiquito Creek and Long Canyon Creek. The location of proposed energy dissipaters is provided on Figure 1.4. Dissipaters will be designed based upon storm drain outlet hydraulic conditions, such as discharge, velocity and pipe size, and location within the River.

   b. Drainage from the Project and SR-126 would pass through storm drain outlet pipes that discharge to the River. Eleven outlet structures would be constructed in conjunction with the soil cement improvements. Please refer to the attached

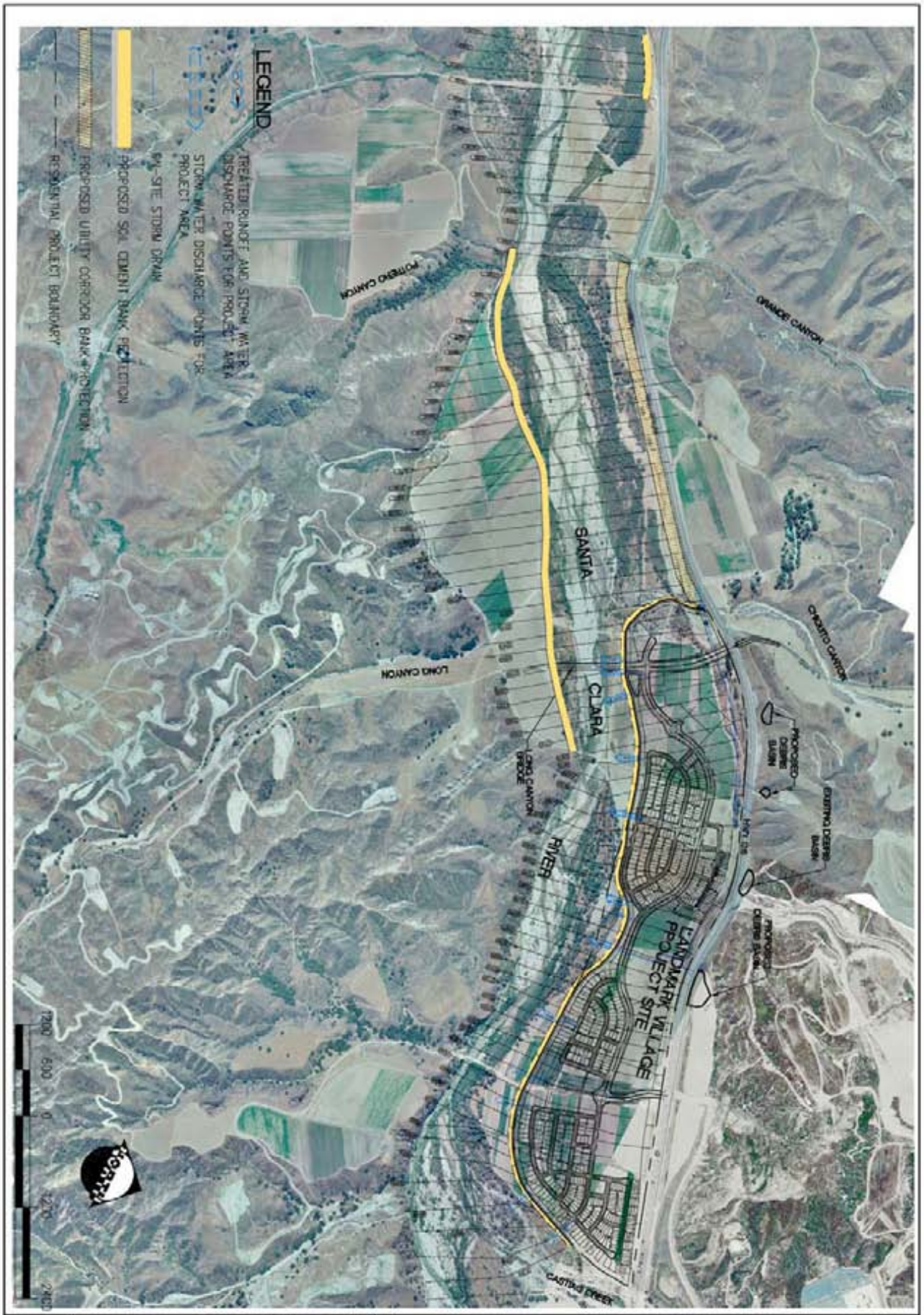

FIGURE 1.4

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DEBRIS BASINS AND DISCHARGE LOCATIONS

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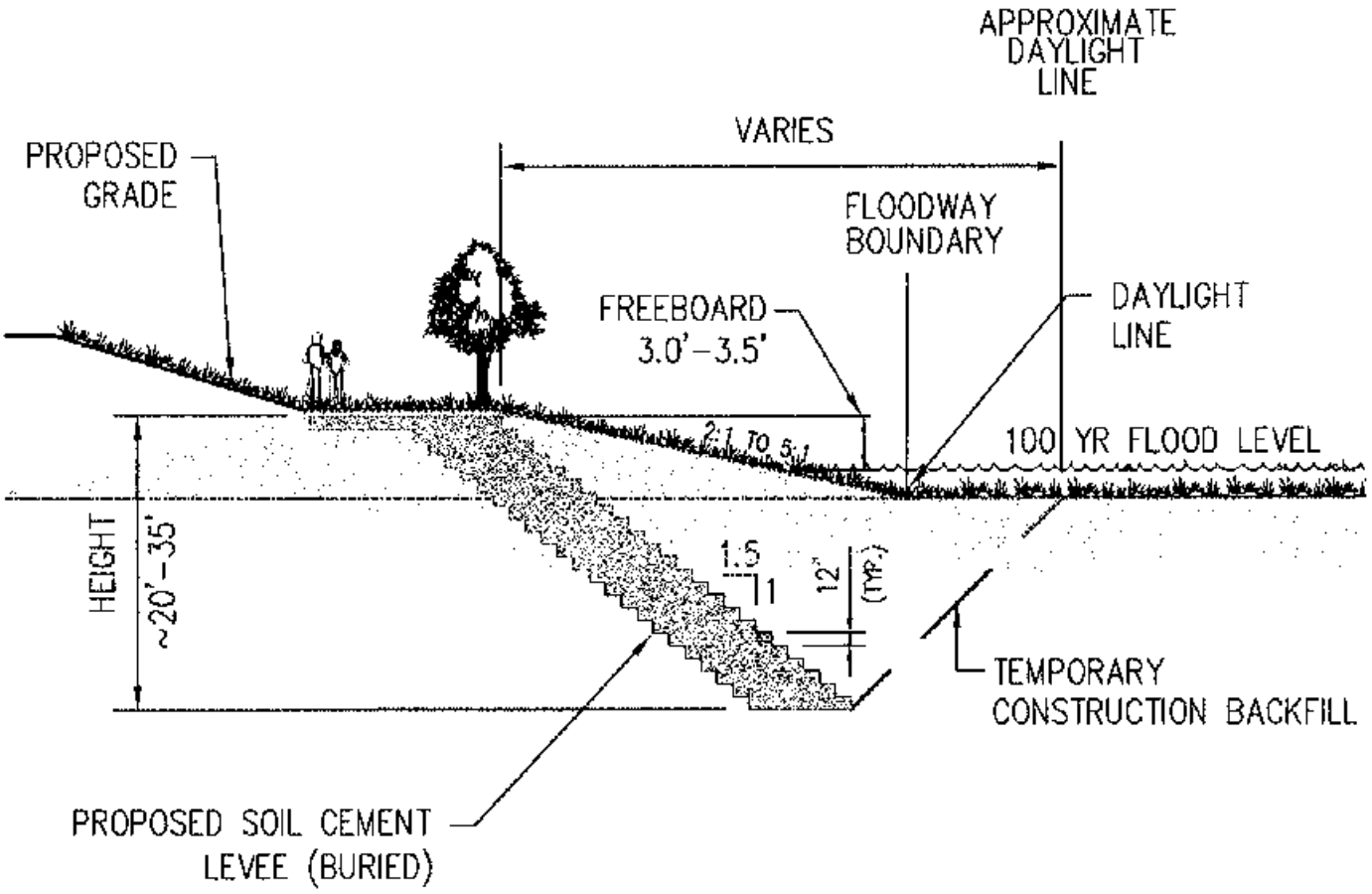
Psomas Landmark Village Drainage Concept report and the summary in Section 1.1.3 below.

2. *Soil Cement/Bank Stabilization*
The Project would include buried soil cement along the River and Castaic Creek adjacent to and downstream of the Project site. In total, approximately 17,700 linear feet (LF) of River and creek bank would be provided with buried soil cement protection. This would include approximately 10,900 feet fronting the Project site (RS 32265 to 22195), and approximately 6,800 LF on the south bank adjacent to the Long Canyon Road Bridge (Figure 1.4). The soil cement is required to protect residential and commercial development and the Long Canyon Road Bridge. The installation of soil cement in the vicinity of the approved Newhall Ranch Water Reclamation Plant (WRP) will likely be installed prior to implementation of the Project, and was previously evaluated as part of the Project-specific impact analysis for the WRP, which was provided in the previously certified Newhall Ranch EIR (SCH No. 95011015).

Figure 1.4 depicts soil cement bank protection extending about 6,000 feet downstream (west) of the Long Canyon Road Bridge along the southern bank of the River. The bank stabilization proposed downstream of Long Canyon Road is necessary to mitigate impacts associated with the Landmark project. An additional approximately 4,750 LF of soil cement bank stabilization is located approximately between STA 950 and STA 5700, downstream of the Project site, and is designed to protect the WRP. The bank stabilization related to the WRP was approved and analyzed at a project-level with the Newhall Ranch EIR.

Most of the proposed bank protection would consist of buried soil cement to provide scour and freeboard flood control protection. In determining the design of the bank protection, several factors were considered, including: (1) flood control stability and durability of bank protection; (2) bank protection maintenance considerations; (3) environmental compatibility with the native area, resource enhancement concepts, and aesthetic considerations; and (4) prior success in construction and cost of construction. Soil cement bank protection provides a stable riverbank protection material, in terms of both surface erosion and structural stability. Additionally, soil cement bank protection will be mostly buried. The exposed top portion of the soil cement will be compatible with the native earth re-vegetated resource area. A typical soil cement cross-section is shown in Figure 1.5.

Soil cement is a highly compacted mixture of soil, cement, and water. As the cement hydrates, it hardens into a strong, durable, low-permeability material. Among the benefits to soil cement is that it may provide a more pleasant visual appearance, similar to that of a natural arroyo, as opposed to the visual harshness of



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LANDMARK VILLAGE

TYPICAL SOIL CEMENT CROSS SECTION

FIGURE 1.5

traditional rip-rap. Construction projects like the proposed Project, generally utilize an on-site central batch plant whereby material can be directly excavated from the channel. Excavated material is then transported to a plug mill to separate the native material, if required, and then proceed by conveyor to a batch plant. The overriding benefit to a batch plant operation is that it allows quality control of the design mix being generated through computer management. The percentage by weight for the cement content can range from eight to 12 percent, depending on native material clay content. High clay content increases the cement requirement. Soil cement mix from the batch plant has a water content of approximately 90% when ready for application. The soil cement mixture is applied in 6-9" sheets called lifts, equal in width to the spreading equipment, which is generally nine feet (trimmed to eight feet). A roller then compacts the soil cement after each lift is applied. Soil cement bank protection slopes can be constructed very steep, usually 1h:1v, which reduces the right-of-way requirements compared to other alternatives with milder side slopes. An additional benefit of the steep side slope is that it facilitates the replacement of native material behind the engineered embankment if it is ever overtopped, since it can stand like a gravity wall. Following the final lift application, the exposed channel face can be trimmed to generate a clean surface and remove any soil cement that was not compacted.

3. <u>Turf Reinforcement Mat</u>
Turf Reinforcement Mat (TRM) bank stability protection along the Newhall Ranch SR-126/River utility corridor would be provided by installing approximately 4,700 LF (RS 22195 to 17785) of TRMs along the southern edge of the utility corridor from the western end of the Project to the easterly end of the previously approved Newhall Ranch WRP. Figure 1.4 depicts the locations where TRMs would be installed.

TRMs are designed to reinforce vegetation at the root and stem allowing vegetation to be used as erosion control in areas where flow conditions exceed the ability of natural vegetation to remain rooted. This includes applications with high slopes or stream banks where grouted rip-rap and concrete channels are aesthetically undesirable.

TRM products are constructed of two basic materials that perform different functions: (1) permanent netting designed to provide permanent structure and strength to the vegetation at the root and stem level; and (2) degradable natural and synthetic fiber netting that provides erosion control immediately after installation by holding seed and soil particles in place and trapping moisture on the soil surface. A combination of the two can be used to provide erosion control, vegetation establishment and reinforcement at one location. TRMs are secured to the soil surface using a predetermined staple pattern and either wire soil staples or

biodegradable stakes. The portion of bank stabilization between the River and OCP Road will be constructed as a part of this Project because protection of the Plant is needed. This bank stabilization was analyzed as part of the previously certified EIR/EIS in conjunction with the approval of the Natural River Management Plan (NRMP).

4. *Long Canyon Road Bridge*

   The Long Canyon Road Bridge over the River is to be located at RS 22960, approximately 500 feet upstream of the Long Canyon Creek discharge to the River (Figure 1.4). The bridge's proposed span is approximately 980 LF with eleven piers within the River along the span. Bridge abutments are approximately 500 LF of River length consisting of reinforced concrete transitioning to soil cement through a 50 LF of River length of rip-rap.

5. *SR-126/Castaic Creek Bridge Improvements*

   The SR-126/Castaic Creek Bridge is to be widened to three lanes in each direction. Concurrently, bridge abutments would be widened and extend up to 500 LF on both sides of Castaic Creek. The buried bank stabilization would tie into the abutment with an approximate 50 LF section of rip-rap.

1.1.3 Proposed On-Site Drainage Improvements

At Project build-out, runoff from the six drainage areas that drain through or onto the Project site, as defined by the Psomas Landmark Village Drainage Concept Report (September 15, 2004) (Figure 1.6), would continue to flow through the Project site. Runoff from the developed portions of the Project would be channeled through the proposed stormwater conveyance system and discharged to the River after passing through various debris and water quality basins. (*Refer to*, Psomas Landmark Village Drainage Concept Report.) As required in the Los Angeles County Department of Public Works memorandum entitled, "*Level of Flood Protection and Drainage Protection Standards*," all on-site drainage systems carrying runoff from developed areas are to be designed for the 25-year Design Storm (Urban Flood), while storm drains under major and secondary highways, open channels (main channels), debris carrying systems, and sumps are to be designed for the Capital Flood.

Runoff from the developed portions of the Project would be conveyed through the Project site using a combination of grading, storm drainpipes, vegetated swales, catch basins, retention/detention basins, water quality basins, outlet structures, and debris basins. The proposed on-site drainage improvements are described below. The locations of such improvements are also illustrated in the Psomas Drainage Concept Map in Figure 1.7, which also depicts the post-development drainage patterns of the Project site.

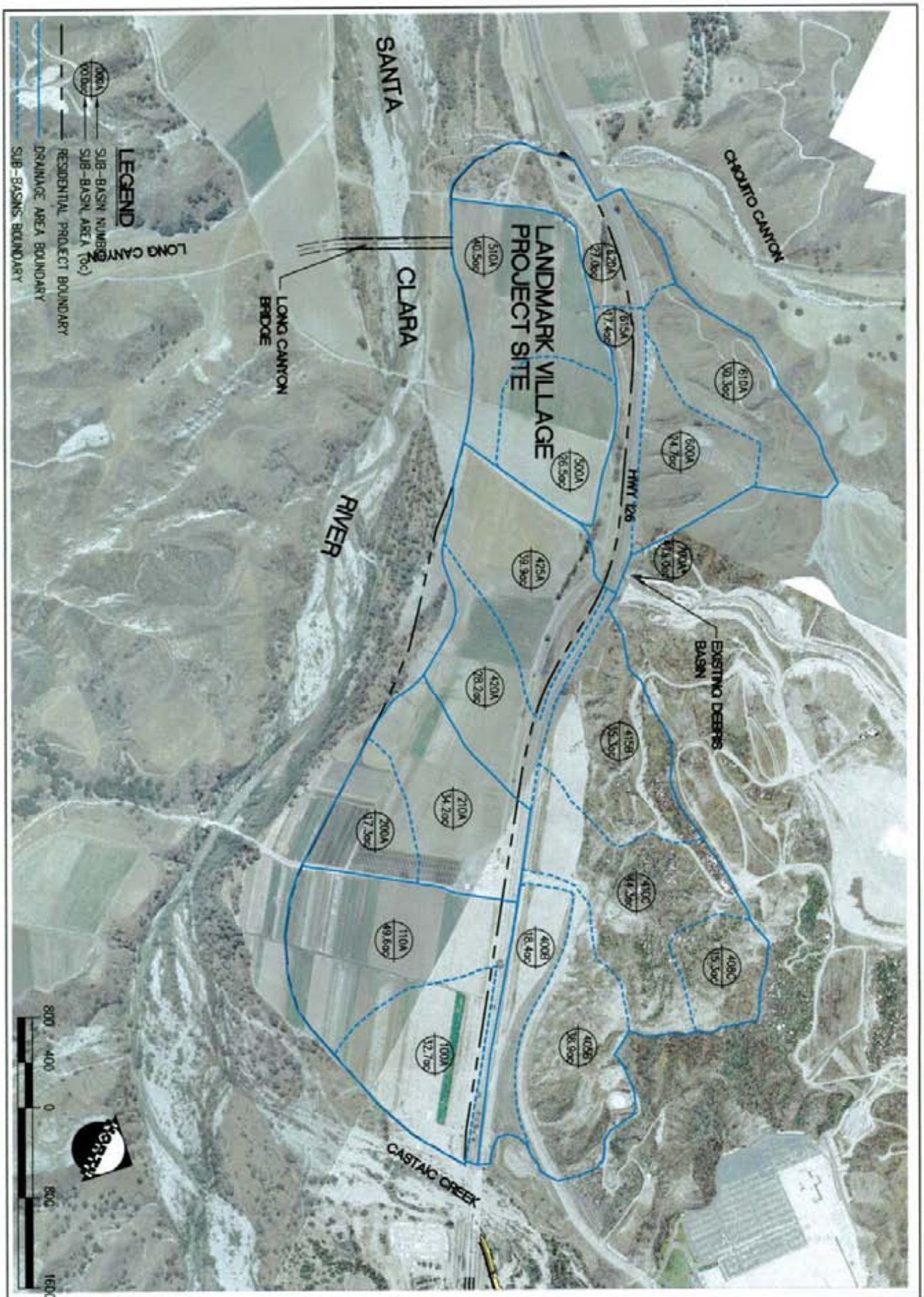
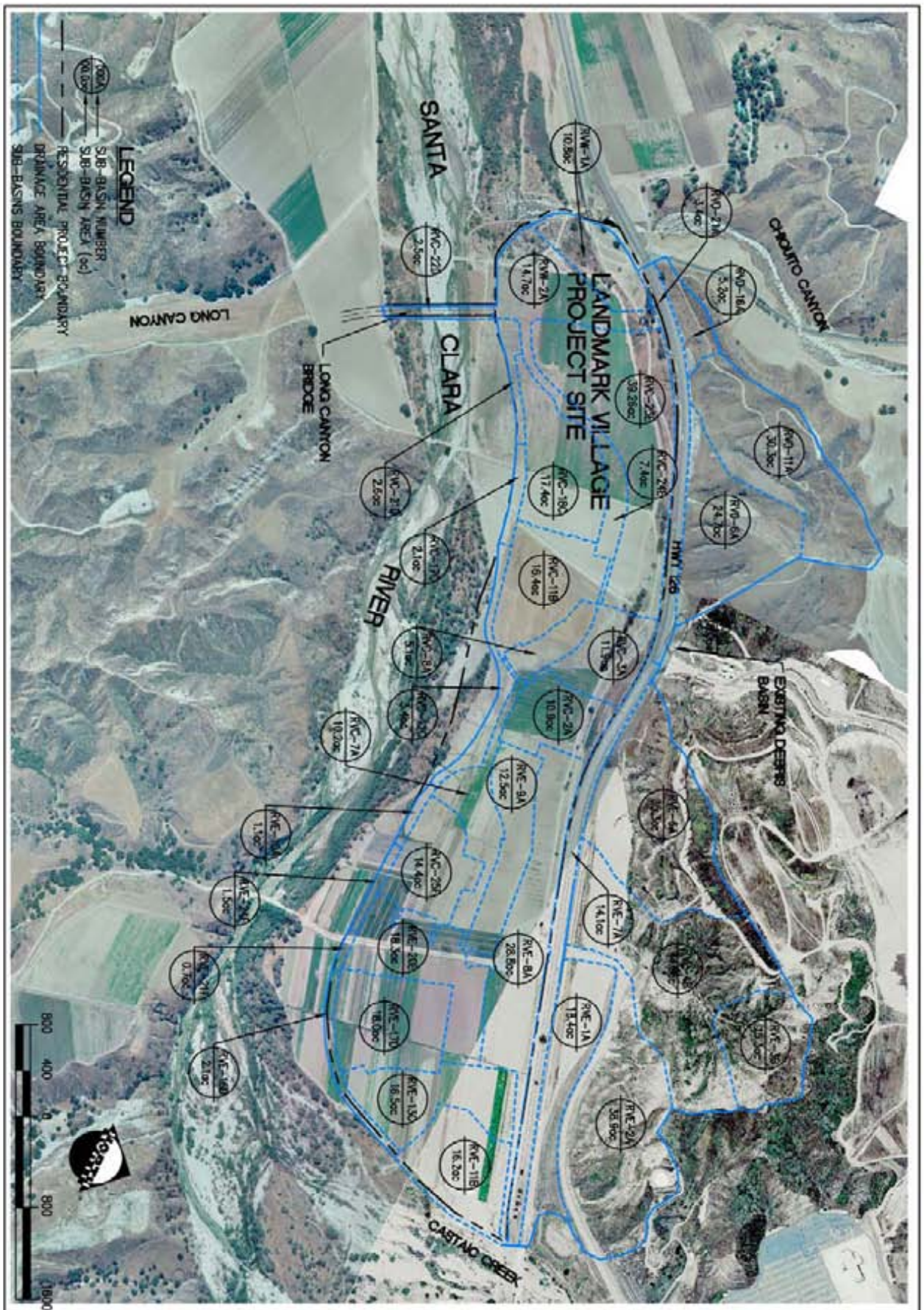


FIGURE 1.6	PACE PACIFIC ADVANCED CIVIL ENGINEERING 17620 NEWHOPE STREET, SUITE 200 FOUNTAIN VALLEY, CA 92708 PH: (714) 481-7300 FAX (714) 481-7399	SCALE 1"= 800' DESIGNED DJ DRAWN JEP CHECKED MEK DATE 04-26-05 JOB NO.	JOB LANDMARK VILLAGE SANTA CLARITA CA

TITLE: ON-SITE EXISTING CONDITIONS SUB BASINS (FROM PSOMAS DRAINAGE CONCEPT)

P:\7841E\Engineering\globalExhibits\7841E-EXISTING PSOMAS SUB BASINS-FIG 1.6.dwg - Tab: IMPROV MAP-1000 SCALE By: jcochran on Jun. 21, 2005 at 10:01 am



PACE
PACIFIC ADVANCED CIVIL ENGINEERING
17500 RAMONA STREET, SUITE 300
FOUNTAIN VALLEY, CA 92708
PH (714) 481-7500 FAX (714) 481-7508

SCALE	1"= 1200'
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DATE	04-26-05
JOB NO.	

JOB
LANDMARK VILLAGE
SANTA CLARITA CA

TITLE
ON-SITE PROPOSED CONDITIONS SUB BASINS (FROM PSOMAS DRAINAGE CONCEPT)

FIGURE 1.7

P:\7841E\Engineering\Global\Exhibits\7841E-PROPOSED PSOMAS SUB BASINS-FIG 1.7.dwg - Tab: IMPROV MAP-1000 SCALE By: jpinto on Jun. 30, 2005 at 08:20 am

Project on-site drainage facilities include:

- *Storm Drains*
  Storm drains (pipes and reinforced concrete boxes) designed for either the 25-year or 50-year Capital storm would consist of both privately maintained systems (Homeowner's Associations, Assessment Districts etc.) and publicly maintained systems (County of Los Angeles). The minimum publicly-maintained mainline pipe size is 18-inch connector pipes for clear flows.

- *Open Channels*
  Small open channels would consist of rectangular and trapezoidal concrete channels, and would be designed for either the 25-year or 50-year Capital storm, depending on the source of the runoff. The channels sized for the 50-year Capital storm would have greater capacity than those sized for the 25-year storm.

- *Low Flow Pipes and Outlets*
  To reduce pollution impacts from the low flow runoff, a series of pipes and outlets would be provided to intercept first flush runoff from developed portions of the Project. Pollutants expected to be generated on the Project site, their potential water quality impacts, and water quality control are discussed in the Geosyntec Water Quality Technical Report for the Project. Additionally, the Psomas Drainage Concept Report provides a Standard Urban Stormwater Mitigation Plan (SUSMP) for the Project site.

- *Catch Basins*
  Catch basins would be provided to intercept flows beyond the 10- and 25-year storms and at strategic locations to minimize flooding at street intersections and at sump locations.

- *Debris Basins*
  To reduce debris discharged through and from the Project site, debris basins are proposed to intercept flows from undeveloped upland areas prior to discharge into the on-site storm system (Figure 1.4).

- *Treatment BMPs*
  In order to comply with Storm Water Pollution Prevention Plans (SWPPPs) mandated by the State of California, treatment BMPs including ponds, vegetated swales and bioretention areas will be constructed where necessary to ensure that urban runoff from the Project site will meet or exceed water quality criteria.

1.2 Materials and Documents Incorporated by Reference

The following is a list of references used in this report. The documents referred to, referenced or cited in this report are incorporated by reference and are available for public review at the Los Angeles County Department of Regional Planning, 320 West Temple Street, Room 1382, Los Angeles, California 90012.

- Center for Watershed Protection. *The Practice of Watershed Protection* (2000).
- Chow, VT. *Open Channel Hydraulics* (pg *165* and pg *185)*. McGraw Hill Civil Engineering Series (1959).
- *Federal Emergency Management Agency (FEMA) Flood Insurance Map 065043-0340* (October 20, 2002).
- Los Angeles County Department of Public Works. *Hydrology Manual* (December 1991) and *Sedimentation Manual* (June 1993).
- Los Angeles County Department of Public Works. *Hydrology Manual & Appendix*, 1991.
- Los Angeles County Department of Public Works. *Development Planning for Storm Water Management, A Manual for the Standard Urban Storm Water Mitigation Plan (SUSMP)* (September 2002).
- Los Angeles County of Public Works. *Level of Flood Protection and Drainage Protection Standards* (1986).
- Los Angeles County Department of Public Works. Santa Clara River Enhancement and Management Plan, *Flood Protection Report* (June 1996 Final Draft)
- Psomas. *Landmark Village Drainage Concept Report* (September 15, 2004).
- Psomas. *Surveyed topography data for River Village (Landmark Village)*, dated 1999.
- United States Army Corps of Engineers. *Santa Clara River Adopted Discharge Frequency Values* (adopted May 3, 1994 by the United States Army Corps of Engineers, the Ventura County Flood Control Department and the Los Angeles County Department of Public Works).
- Valencia Company. *Natural River Management Plan (Permitted Projects and Activities under the United States Corps of Engineers 404 Permit, California Department of Fish and Game 1603 Agreement and 2081 Permit* (November 1998).
- Sikand. *Newhall Ranch Specific Plan Master Drainage Concept, Santa Clara River* (April 2001).
- Sikand. *Newhall Ranch Santa Clara River HEC-RAS Study* (June, 28 2000).
- Sikand. *Supplemental Report for Newhall Ranch Santa Clara River HEC-RAS Study* (July 2000).
- Simons, Li & Associates. *Summary Report, Fluvial Study of Santa Clara River and the Tributaries* (November 1990).
- Revised Additional Analysis to the Newhall Ranch Specific Plan and Water Reclamation Plant Final EIR (SCH No. 95011015), Volume VIII, May 2003, including Section 2.3, Floodplain Modifications.

1.3 Definitions

The following terms and acronyms are defined below, and are used in this report:

100-year storm	Precipitation event corresponding to a flood that has a 1/100, or one percent, chance of occurring in any given year.
ACOE	Army Corps of Engineers

Runoff (Qbb)	Runoff from burned areas that are laden with burned vegetation, fines, rocks, mud and other debris.
Capital Flood (Qcap)	The runoff resulting from a theoretical storm based on Los Angeles County Department of Public Works methodology. The "model" storm is derived from 50-year frequency rainfall values, which occur in a time sequence patterned after actual major extra-tropical storms occurring in the Los Angeles Region. The calculations of runoff are also based on the soil types and percent of impervious surfaces in a watershed area, and on the assumption that some undeveloped portions of the watershed are burned, resulting in significant amounts of debris and sediment being added to the runoff.
CDFG	California Department of Fish and Game
Clear Runoff (Qc)	Runoff that is absent of fines (finely crushed or powdered material), mud, rocks, vegetation, and other debris.
Coefficient of Runoff	Variable in the rational and modified rational method runoff formula, which is dependent upon soil type, rainfall intensity, and the percent of imperviousness.
CWA	Federal Clean Water Act
Detention Basin	Physical flood control structure that captures storm flows and temporarily stores these flows in man-made surface depressions and, therefore, not available for producing surface runoff during storm events. See also "Water Quality Detention Basins."
Depression Storage	Runoff that is captured by and settles in a natural or manmade depression and does not continue downstream.
Erosion	The wearing away of land surfaces by water, wind, and ice.
FEMA	Federal Emergency Management Agency
First Flush	First flush is defined in Los Angeles County as the runoff volume generated from the first 0.75-inches of rainfall in a 24-hour period.
Floodplain	Total area subject to inundation by a 100-year flood.
Impervious	A description of a soil that will not permit water to flow through it.
Infiltration	The penetration of water through the ground surface into sub-surface soil or the penetration of water from the soil

	into sewer or other pipes through defective joints, connections, or manhole walls.
Interception	That portion of precipitation captured by vegetation. Intercepted precipitation is disposed of by drip, stem flow, or evaporation (or sometimes sublimation, in the case of snow, sleet, hail, or freezing rain).
LACDPW	Los Angeles County Department of Public Works
Peak Flow	Peak discharge rate measured in cubic feet per second (cfs).
Percolation	The downward flow or filtering of water through pores or spaces in rock or soil.
Q	Discharge rates measured in cubic feet per second.
Q50bb	Peak runoff from a 50-year rainfall intensity storm from undeveloped areas that is laden with burned vegetation, fines, rocks, and other debris.
Q50c	Peak runoff from a 50-year rainfall intensity storm from developed areas or from undeveloped areas that are not assumed to be burned or bulked.
River	Santa Clara River
Runoff	The portion of rainfall, melted snow, or irrigation water that flows across the ground surface rather than filtrating into the soil.
RWQCBLAR	Regional Water Quality Control Board, Los Angeles Region
Sedimentation	Deposition of waterborne sediments due to a decrease in water velocity and a corresponding reduction in the size and amount of sediment, which can be carried by the flowing water.
Sump	An area from which there is no surface flow outlet.
SUSMP	Standard Urban Stormwater Mitigation Plan
SWPPP	Storm Water Pollution Prevention Plans
SWRCB	State Water Resources Control Board
Transpiration	The process by which water vapor is lost to the atmosphere from living plants.

Velocity	The rate or speed at which surface runoff water flows either over land or through a channel, measured in feet per second (fps).
Watershed	All land and water within the confines of a drainage divide.
Waters of the U.S.	Although the definition is subject to change, "Waters of the U.S." is defined as follows: All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; all interstate waters including interstate wetlands; and all other waters, such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters: (1) which are or could be used by interstate or foreign travelers for recreational or other purposes; or (2) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) which are used or could be used for industrial purposes by industries in interstate commerce. Also included are all impoundments of waters otherwise defined as waters of the United States under the definition; tributaries of waters identified above; the territorial seas; and wetlands adjacent to waters (other than waters that are themselves wetlands) identified above. (33 C.F.R. §328.3(a)(2004).) Under the U.S. Army Corps of Engineers' definition, "Waters of the United States" are defined by the "ordinary high water mark," which can be identified by physical characteristics, such as channel scouring, bank "shelving," areas cleared of terrestrial vegetation, litter and debris, or other indications that may be appropriate.
Wetlands	Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. (33 C.F.R. §328.3(b)(2004).)

2 Methodology

Two development scenarios are addressed in this report:

1. Existing;
2. Existing with Project.

Brief summaries of the hydrologic and hydraulic methodology used in this report are presented as background information. The methodology was used to calculate pre- and post-development runoff quantities, the capacities of proposed improvements, and the effects of development on the River.

A third scenario, not addressed in this report, is a cumulative buildout scenario. This scenario was previously evaluated in the certified Newhall Ranch EIR, as revised by the Revised Additional Analysis, Vol. VIII (May 2003). As indicated earlier in this report, the flood protection improvements proposed in conjunction with the Project are consistent with those shown and analyzed in the buildout scenario for the Newhall Ranch Specific Plan.

2.1 Hydrology Background and Methodology

2.1.1 Los Angeles County Criteria

The Flood Control Division of the Los Angeles County Department of Public Works (LACDPW) regulates storm runoff protection. The LACDPW issued a 1986 memorandum entitled, "Level of Flood Protection and Drainage Protection Standards," for development projects in Los Angeles County. The memorandum established Los Angeles County policy on levels of flood protection and requires that the following facilities be designed for the Capital Flood: all facilities not under State of California jurisdiction that intercept flood waters from natural drainage courses; all areas mapped as floodways; all facilities that are constructed to drain natural depressions or sumps; and all culverts under major and secondary highways. All facilities in developed areas that are not covered by the Capital Flood protection conditions must be designed for the Urban Flood, or runoff from a 25-year frequency design storm. Because the Project would also intercept flood flows from natural areas, the Project's storm drainage facilities that accept these flows must be sized and designed for the Capital Flood.

In addition to meeting this required level of flood protection, all development in the River watershed must meet standards adopted by the LACDPW for the River and its major tributaries. (*Refer to*, County Sedimentation Manual, pp. 2-2 to 2-6.) Further, properties adjacent to the River that include improvements along and across a segment of the River (including the Project) must meet the standards adopted in the Newhall Ranch EIR and Revised Additional Analysis, Volume VIII (May 2003).

2.1.2 Explanation of the County Capital Flood

In 1931, the Los Angeles County Flood Control District (LACFCD) (now, the Flood Control Division of the County's Department of Public Works) began development of a comprehensive plan of flood control facilities to collect and convey flows from the mountainous canyons, the alluvial fans, and the urbanized coastal plain.

The major needs in designing the system were: reduction of damage due to high canyon flows, conveyance of large volumes of water in a major storm, and the ability to meet future flood control needs. The design of the flood protection system for the County is based on the Department of Public Works' Capital Flood hydrology.

The Department's Capital Flood (or Q_{CAP}) hydrology is based on a "design," or theoretical storm event that is derived from 50-year frequency rainfall values and is patterned after actual major extra-tropical storms observed in the Los Angeles region. The 50-year frequency design storm is assumed to occur over a period of four days, with maximum rainfall occurring on the fourth day.

Analysis of recorded major storms reveals that, during the 24-hour period of maximum rainfall, rainfall intensity typically increases during the first 70 to 90 percent of the period and decreases in the remaining time. Furthermore, approximately 80 percent of the amount of the 24-hour rainfall occurs within the same 70 to 90 percent of the period. In developing the Q_{CAP}, the 50-year frequency design storm is assumed to fall on saturated soils. In converting rainfall to runoff, rainfall that is not lost due to the hydrologic processes of interception, evaporation, transpiration, depression storage, infiltration, or percolation is assumed to be surface runoff. The effect of snowfall or snow melt on rainfall-runoff relationships is a consideration in only a very limited portion of the County (i.e., the higher elevations) where snowfall accumulates in winter.

Another assumption made in developing a Capital Flood design flow rate is that some natural portions of the watershed have been burned by fire. When a watershed burns, the soil infiltration rate decreases due to the loss of vegetation and physical changes in the soil. The County has run field infiltrometer tests to quantify the effect that burning has on the coefficient of runoff. The effect of burning the watershed can increase the design runoff rate from 10 percent to 20 percent.

The final factor in adjusting the Capital Flood design flow rate is referred to as a bulking factor. In the area where a watershed is burned, the runoff would carry with it a large layer of eroded topsoil. This sediment, along with the associated burned trees and brush, is referred to as debris. In order to account for these quantities of debris, the design flow rate is artificially increased using a prescribed bulking factor, which is a function of not only soil type, but also the steepness of the terrain and the size of the drainage basin. The bulking factors for larger drainage basins range

from about 1.20 to 1.50, or from 20 to 50 percent over and above the burned flow rate.

In September, 2003, LACDPW revised the hydrologic method that accounts for fire effects on runoff computations. In the previous practice, a completely burned watershed was assumed. The current policy was updated to employ a statistical approach that relates historical fire data and vegetation recovery rates to changes in runoff coefficient of soil. A fire factor (*FF*) has been developed to represent the effectively burned percentage of a given watershed. This factor is used to adjust runoff coefficients for Q_{CAP} hydrology. The *FF* adjusts the coefficient by indexing between an unburned and completely burned soil coefficient for a given soil. This method has yet to be officially adopted by the County.

In this report, the former Capital discharge is used for analysis and comparison. In design stages, the updated 2003 Capital discharge will be employed as this updated version is anticipated to be adopted by the County between now and approval of the Project. Because the 2003 Capital discharge rate is lower than the pre-2003 discharge rate, using the updated discharge values in the design phase will result in reduced calculated flood flows and a reduced calculated potential for flood-related impacts. Using the pre-2003 Capital discharge is more conservative in determining impacts. Any changes in design of bank protection resulting from utilizing the updated Capital discharge will only reduce the top of bank protection elevation and toe of the bank protection depth. Final design of bank protection will adhere to LACDPW Q_{CAP} design standards.

In summary, the County's Q_{CAP} is based on a theoretical four-day storm event occurring right after the watershed has been burned with the resulting flow rate being increased again by a bulking factor, thereby yielding a peak flow rate that is 32 to 80 percent higher than a 50-year storm over an unburned-unbulked drainage basin. The probability of the occurrence of all the theoretical assumptions identified in the County's Capital Flood is extremely small, and yields greater design flows than the Federal Insurance Administration's methodology for calculating the 100-year and 500-year floods. As a result, the County's methodology is more conservative than that of the Federal Emergency Management Agency (FEMA).

2.1.3 Method of Drainage Analysis

The engineering term for the method used to properly size pipes and channels is "hydraulic analysis." To determine the proper sizes of pipes and channels, assumptions must be made regarding the amount of rainfall to design for and the amount and type of development that would take place in a drainage basin. An estimate must also be made of how often that amount of rainfall could be surpassed. This is referred to as the event exceedence probability, or its reciprocal value — return period. For example, a storm that has a 10 percent exceedence probability is a storm that has a 10 percent chance of meeting or exceeding a particular volume of rain in any given year. The reciprocal of this number is also known as a 10-year return period storm. An important concept to keep in mind is

that a pipe or channel is designed for a discharge (measured in cubic feet per second), not a volume (measured in cubic feet or acre-feet). A dam or a lake is designed for storing or containing a fixed volume of water. A pipe of a fixed size, on the other hand, can carry discharges, depending on the pressure placed on the water.

In designing a storm drain system, the size of a pipe that would safely carry a predicted discharge must be calculated. A 1-foot square box that is 1-foot deep (a cubic-foot) can hold 7.5 gallons of water. Based on this fact, the amount of stormwater passing through a pipe or channel in one second can be calculated by multiplying the cross sectional area of the flow in the pipe (in square feet) by the velocity of storm flows through the pipe in feet per second. This three-dimensional rate of flow is measured in cubic feet per second, or cfs.

With the above concepts in mind, the effects of development on natural ground can be considered. Buildings, driveways, patios, sidewalks, and roads all create new impervious cover to the natural ground and prevent water from infiltrating into the ground. The water that would normally infiltrate the ground would therefore run off at a higher than normal rate. Therefore, the surface discharge from developed areas will be greater than that from undeveloped areas.

LACDPW requires that all designs utilize exceedence probability calculations for design and analysis. By employing this methodology herein, this report ensures consistency with County design standards.

2.1.4 Explanation of Design Hydrology

(a) Effects of Soil Type and Amount of Imperviousness on Runoff Rates

The rate of runoff is directly related to the type of soil on the site. Certain soil types accept water faster (are more permeable) than other soils. Therefore, the types of soils present on a site are used in the calculations of runoff. Different soil types have very different water infiltration rates. If sandy soil (highly permeable) is paved over, the coefficient of runoff (C) would greatly increase, whereas if clay soil (not highly permeable) is paved over, runoff values would go up, but by a smaller percent of the total when compared to sandy soil (because sandy soils conduct water faster). In small storms, some soils can absorb 100 percent of the rainfall. For example, soil type 015 (Tujunga Fine Sandy Loam) can completely absorb a 0.5-inch per hour (in/hr) storm and almost completely absorb a 1.0 in/hr storm, thereby yielding extremely low runoff rates. For a 200 acre parcel with soil types 015 (Tujunga Fine Sandy Loam) and 012 (Ramona Clay Loam), radically different runoff quantities for the same rainfall events occur. For an intense storm, *I=1.0 in/hr*, and the very pervious soil type 015 (Tujunga Fine Sandy Loam), the runoff rate would be 20 cfs. For the same size parcel on a very impervious soil, such as soil type 012 (Ramona Clay Loam), the runoff rate would be 168 cfs.

(b) Effects of Burning and Bulking

In an undeveloped watershed, Capital Flood flow rates assume a burned condition, which causes the coefficient of runoff to increase. Further, after increasing the coefficient of runoff for burning, the flow rate is then multiplied by a bulking factor, which is used to account for the amount of mud and debris that would be contained within the flow from the burned watershed. In the case of the Project, the increase in runoff, or flow rates, due to an increase in the coefficient of runoff (C) to account for burning is from 10 to 20 percent. Application of the bulking factor to account for debris production would increase runoff quantities by 20 to 50 percent over and above the burned flow rate.

(c) Effects of Development

As previously noted, development places impervious materials over soils that had previously infiltrated stormwater. Once the impervious materials are placed over the soil, little direct infiltration occurs and runoff increases. Because development does not typically completely cover the ground surface, portions of each developed parcel (e.g., front, side, and rear yards, landscaping, open space, etc.) remain permeable to stormwater. Percent imperviousness for each land use (existing and proposed) on the Project site is presented in Table 2.1.

Table 2.1: Percent Impervious for Selected Land Uses

Land Use	Percent Imperviousness (%)
Agricultural[3]	15
Transportation	100
Single Family Residential	42
Multi Family Residential	68
Commercial	92
Open Space	0

Values are from GeoSyntec Consultants (2005).

2.2 Santa Clara River Hydraulics

The floodplain conditions of the River were modeled using River Analysis System (RAS) software developed by the U.S. Army Corps of Engineers (U.S. ACOE) Hydrologic Engineering Center (HEC). Inputs to the HEC-RAS model include channel geometry, boundary conditions, hydraulic roughness, and hydrology. HEC-GeoRAS is a HEC-developed pre-/post-processor to the hydraulic model HEC-RAS and was used to compile and store a three-dimensional representation of the land surface for defining channel and floodplain geometry. A Triangular Irregular Network (TIN) was created from surveyed 2-foot topographic data using the ArcInfo program Topogrid. The TIN was used to extract geometric data for hydraulic analysis. The original River modeling prepared by Sikand Engineering and utilized in the Newhall Ranch Revised Additional Analysis, Volume VIII (May 2003) used the HEC-RAS predecessor hydraulic model, HEC-2. The HEC-2 geometric data input methodology utilized proprietary hydraulic modeling software BOSS, which follows a very similar data input methodology as

described above. The original HEC-2 model was converted and input into HEC-RAS.

The HEC-RAS model was used to provide current state of the art one-dimensional hydraulic water surface profile modeling data output. The output data from HEC-RAS is capable of being utilized by Graphic Information System (GIS) software in a variety of methods, which facilitate more detailed evaluation of the modeling output data such as water surface elevation, floodplain limit, velocity, depth of flow, and other hydraulic parameters.

The modeling prepared for the Project is consistent with that prepared for the Newhall Ranch Specific Plan. Discharges include the 0.5 (2-year), 0.2 (5-year), 0.1 (10-year), 0.05 (20-year), 0.02 (50-year), and 0.01 (100-year) annual probability return periods. The numerical modeling includes velocity distributions for 100 River cross-sections and more than 20 tributary cross-sections. A portion of these cross-sections is illustrated in Figure 1.4. Manning's roughness values for the model bed were taken from analysis of aerial photography of the Project site, and vary horizontally along each model cross-section. The proposed conditions analysis was conducted by modifying the existing conditions model such that bank protection, described below, was placed within the model as encroaching levees. The impacts of the bridge are included as a part of the numerical modeling analysis.

The Project models for the River were created by modifying existing cross-section geometrics of the River to simulate the hydraulic effects of the proposed Project soil cement and erosion protection, including the Long Canyon Road Bridge abutments and piers. The encroachment due to the soil cement was conservatively approximated with levees in the hydraulic model (model levees set at equivalent elevation on slope of channel invert). The modeling of the proposed Long Canyon Road Bridge span, soil cement, pier spacing, and abutment locations are substantially consistent with the Newhall Ranch Revised Additional Analysis, Volume VIII (May 2003). For modeling and impact analysis consideration, these conservative bridge configurations would have the greatest impact on River hydraulics. It should be pointed out that the present analysis is based on the Project-specific design details, not assumptions from the previous Newhall Ranch Specific Plan evaluation.

Existing Santa Clara River discharge rates for the 2-, 5-, 10-, 20-, 50-, and 100-year storm events were obtained from a 1994 U.S. ACOE study entitled, Santa Clara River Adopted Discharge Frequency Values. This study is based upon a frequency analysis of stream flow data along the Santa Clara River and, therefore, approximates River flows from observed data. These values are presented in Table 2.2. It is important to note that these values include discharges from upstream tributaries and direct runoff from the watershed.

Six of the seven recurrence intervals included in the analysis were obtained from the 1994 study; the seventh, the Los Angeles County Capital Flood, is referenced from the previously published LACDPW ML Maps 43-ML-24 and 43-ML-25 of floodplain and floodway. For comparison purposes, the Existing and Existing plus Project conditions are evaluated under the pre-2003 discharge rate, which is considered the worst case scenario.

Table 2.2 Santa Clara River Existing Conditions Discharge By Return Period (cfs)

Location	Station	2-year	5-year	10-year	20-year	50-year	100-year	Q_{CAP}
DS Commerce Center Drive	35245	1,720	5,240	9,490	15,600	27,500	40,300	138000
At Castaic Cr. Confluence	32265	2,527	8,232	14,942	24,157	41,141	58,207	163000
DS Chiquito Cr. Confluence	22195	2,558	8,333	15,123	24,453	41,646	58,922	165000
At Grande Cyn. Cr. Confluence	17360	2,581	8,408	15,263	24,675	42,025	59,457	166500
DS Protrero Cr. Confluence	15125	2,600	8,480	15,400	24,900	42,400	60,000	168000

DS - downstream

The following hydraulic modeling parameters apply to the two scenarios analyzed in this report:

1. Bank stations;
2. Hydraulic roughness; and
3. Boundary conditions.

As stated previously, buildout or cumulative condition parameters are not addressed in this report, because they were analyzed previously in the certified Newhall Ranch EIR, as revised by the Revised Additional Analysis, and there have been no significant changes to the Specific Plan or its circumstances that would warrant a reanalysis of the prior program-level assessment conducted for the entire Specific Plan area (which includes the Project site).

1. Bank Stations: The bank station locations are approximated as the water surface elevation level of the runoff from an existing scenario 2-year storm event. The 2-year return interval approximates a typical ordinary high water mark.

2. Hydraulic Roughness: Discharge is calculated using hydraulic roughness coefficients in the Manning's equation. Manning's roughness coefficient values are employed in Manning's equation of the form:

$$Q = \frac{1.49}{n} A R^{\frac{2}{3}} S^{\frac{1}{2}}$$

where Q is the discharge in cfs, n is Manning's roughness coefficient, A is the flow area, R is the hydraulic radius, and S is the energy slope.

For this report, the Manning's roughness coefficients were estimated from local condition observations of in-stream and floodplain vegetation, mapped by field biologists (Impact Sciences, 2002). Table 2.3 shows the variation of Manning's roughness coefficients based on vegetation and how those compare to published values. It is important to note that LACDPW bank protection design criteria require use of $n=0.085$ and 0.025 for final design of bank protection top and toe elevation, respectively.

Table 2.3: Hydraulic Roughness Coefficients		
Vegetation/Land Use	**Manning's Roughness Coefficient [used in this study]**	**Reference Manning's Coefficient (Chow 1959)**
Sand with no vegetation	0.025	0.025-0.033
Sand with Sporadic Growth/Grass Pasture	0.035	0.03-0.05
Scattered Brush/Heavy Weeds/Light Brush and Trees	0.05	0.035-0.07
Dense trees	0.15	0.11-0.20

3. Boundary Conditions: Boundary conditions represent the flow conditions at the limits of the hydraulic analysis. In this study, boundary conditions reflect normal depth and an approximate channel slope of 0.5 percent at the upstream boundary and critical depth at the downstream boundary. The input hydrology is the flow rate data for the seven return periods as documented in Table 2.2.

The proposed Project model was created by modifying existing condition cross-section geometries to simulate the proposed Project soil cement and bridges. The encroachment due to the soil cement was approximated with levees in the hydraulic model (model levees set at equivalent elevation on slope of channel invert).

Three minor modifications, as compared to the Newhall Ranch EIR analysis, are proposed with the Project flood protection improvements. They are as follows: (1) modifications to the location of the soil cement tie-in at Chiquito Canyon Creek; (2) avoidance of riparian resource areas near the proposed central park area in the Project site; and (3) a minor realignment of the soil cement both upstream and downstream of the Long Canyon Road Bridge. All three of the bank position modifications are cases in which flood protection is pulled further back from the channel (*i.e.*, farther away from the River) than what was analyzed in the Newhall Ranch Revised Additional Analysis, Volume VIII (May 2003).

3 Existing Conditions

3.1 Drainage Areas and Watercourses

The Santa Clara River traverses the southern portion of the Project site, which is located within a contributing drainage of 996 acres out of the 1,634 square mile Santa Clara River watershed basin (Psomas, Landmark Village Drainage Concept Report). This area represents less than 1 percent of the Santa Clara River basin and consists primarily of agricultural property. Rainfall in the tributary area is an annual average of 17-inches and generally occurs in the winter months. Runoff flows to and through six contributing drainage areas on the site via sheet flows and natural concentrated flows.

3.1.1 Santa Clara River

The reach of the Santa Clara River adjacent to, and downstream of, the Project site has perennial surface flows primarily created by tertiary treated effluent discharges from two upstream water reclamation plants operated by the County Sanitation Districts of Los Angeles County. Natural flows in the River usually only occur in the winter due to storm runoff. The flows vary significantly from year-to-year.

The reach of the River within and adjacent to the Project site has multiple channels (braided). This kind of system is characterized by high sediment loads, high bank erodibility, and intense and intermittent runoff conditions. Combined with the relatively flat gradient of the River at this point (less than one percent), the River has a high potential to aggrade (deposit sediment) at low flow velocities.

Velocities and water surface elevations in the River vary from section-to-section based on various hydraulic and hydrologic parameters. In general, velocity and depth along the River will increase with higher discharge. An example of these relationships is provided in Table 3.1. This data indicates that velocities measured in feet per second (fps), more than double, on average, from the 2-year to the 100-year event, while depth increases approximately 10.25 times, on average. In contrast, discharge increases almost 24 times from the 2-year to the 100-year event. Velocity and water depth percent increases do not correspond to the percent discharge increases because the wide River channel allows flood flows to spread out with increasing discharge.

TABLE 3.1: DISCHARGE, VELOCITY AND FLOW AREA CHANGES BY CROSS SECTION FOR Q_2 AND Q_{100}

STATION	EVENT	Q (CFS)	VELOCITY (FPS)	FLOW AREA (FT^2)	Q_{100}/Q_2	A_{100}/A_2
33310	Q2	1720	4.6	374.2		
	Q100	40300	12.7	3182.0	2.8	8.5
33115	Q2	1720	2.9	590.2		
	Q100	40300	14.7	2735.6	5.1	4.6
32795	Q2	1720	4.6	378.2		
	Q100	40300	9.8	4131.2	2.1	10.9
32605	Q2	1720	4.7	368.5		
	Q100	40300	10.9	3709.6	2.3	10.1
32265	Q2	2527	4.6	547.2		
	Q100	58207	8.6	6811.1	1.9	12.4
31875	Q2	2527	3.1	823.8		
	Q100	58207	9.8	5962.5	3.2	7.2
31585	Q2	2527	5.0	504.2		
	Q100	58207	10.7	5427.2	2.1	10.8
31360	Q2	2527	4.4	568.6		
	Q100	58207	13.7	4235.5	3.1	7.4
31060	Q2	2527	6.0	422.4		
	Q100	58207	11.7	4997.9	1.9	11.8
30720	Q2	2527	4.3	583.6		
	Q100	58207	7.3	8000.2	1.7	13.7
30445	Q2	2527	6.6	380.3		
	Q100	58207	5.6	10469.9	0.8	27.5
30095	Q2	2527	4.0	639.5		
	Q100	58207	5.0	11595.0	1.3	18.1
29815	Q2	2527	6.3	402.3		
	Q100	58207	5.8	10054.0	0.9	25.0
29565	Q2	2527	3.5	725.9		
	Q100	58207	5.7	10272.1	1.6	14.2
29385	Q2	2527	3.6	695.0		
	Q100	58207	6.9	8498.8	1.9	12.2
29140	Q2	2527	7.7	326.9		
	Q100	58207	9.7	5974.3	1.3	18.3
28895	Q2	2527	7.7	327.3		
	Q100	58207	15.5	3746.4	2.0	11.4
28695	Q2	2527	5.7	442.8		
	Q100	58207	25.2	2314.3	4.4	5.2
28500	Q2	2527	6.7	377.4		
	Q100	58207	24.6	2362.5	3.7	6.3
28280	Q2	2527	4.2	597.0		
	Q100	58207	23.2	2514.1	5.5	4.2
28080	Q2	2527	4.7	540.2		
	Q100	58207	17.8	3265.0	3.8	6.0
27925	Q2	2527	5.9	428.0		
	Q100	58207	14.7	3967.0	2.5	9.3
27725	Q2	2527	3.4	744.5		
	Q100	58207	16.4	3545.0	4.8	4.8
27545	Q2	2527	6.1	417.0		
	Q100	58207	17.0	3434.5	2.8	8.2

TABLE 3.1: CONTINUED						
27335	Q2	2527	3.6	703.5		
	Q100	58207	18.2	3207.4	5.1	4.6
27155	Q2	2527	3.9	654.1		
	Q100	58207	14.8	3926.5	3.8	6.0
26990	Q2	2527	5.6	450.7		
	Q100	58207	15.1	3843.8	2.7	8.5
26780	Q2	2527	5.4	465.1		
	Q100	58207	18.0	3239.0	3.3	7.0
26575	Q2	2527	3.4	752.6		
	Q100	58207	11.7	4960.0	3.5	6.6
26355	Q2	2527	6.3	398.9		
	Q100	58207	12.8	4561.3	2.0	11.4
26170	Q2	2527	4.3	583.2		
	Q100	58207	13.6	4288.5	3.1	7.4
25965	Q2	2527	4.8	530.6		
	Q100	58207	9.8	5938.2	2.1	11.2
25785	Q2	2527	4.5	559.7		
	Q100	58207	10.4	5594.5	2.3	10.0
25600	Q2	2527	5.6	448.4		
	Q100	58207	12.3	4731.2	2.2	10.6
25425	Q2	2527	3.9	645.9		
	Q100	58207	13.0	4465.4	3.3	6.9
25215	Q2	2527	6.6	385.2		
	Q100	58207	13.4	4360.3	2.0	11.3
25000	Q2	2527	5.2	490.1		
	Q100	58207	13.7	4251.4	2.7	8.7
24795	Q2	2527	6.0	420.4		
	Q100	58207	11.4	5114.6	1.9	12.2
24550	Q2	2527	4.0	639.0		
	Q100	58207	13.2	4397.8	3.4	6.9
24335	Q2	2527	5.3	477.4		
	Q100	58207	15.1	3857.5	2.9	8.1
24115	Q2	2527	5.8	433.8		
	Q100	58207	12.4	4683.5	2.1	10.8
23975	Q2	2527	4.6	555.4		
	Q100	58207	13.7	4246.2	3.0	7.6
23755	Q2	2527	6.7	379.6		
	Q100	58207	14.4	4030.8	2.2	10.6
23565	Q2	2527	5.2	483.6		
	Q100	58207	13.4	4336.9	2.6	9.0
23365	Q2	2527	6.6	382.7		
	Q100	58207	13.9	4192.2	2.1	11.0
23180	Q2	2527	4.8	532.6		
	Q100	58207	17.6	3308.0	3.7	6.2
23000	Q2	2527	4.4	578.8		
	Q100	58207	10.4	5591.2	2.4	9.7
22790	Q2	2527	4.6	549.2		
	Q100	58207	13.4	4359.5	2.9	7.9
22600	Q2	2527	4.4	576.2		
	Q100	58207	13.3	4371.0	3.0	7.6
22415	Q2	2527	5.8	434.1		
	Q100	58207	15.8	3686.1	2.7	8.5
22195	Q2	2558	6.8	376.7		
	Q100	58922	13.3	4443.2	2.0	11.8
22010	Q2	2558	4.7	548.4		
	Q100	58922	15.4	3816.7	3.3	7.0
21790	Q2	2558	4.2	611.4		
	Q100	58922	15.8	3724.5	3.8	6.1
21615	Q2	2558	5.4	474.7		
	Q100	58922	12.7	4658.5	2.3	9.8
21440	Q2	2558	3.7	698.1		
	Q100	58922	10.9	5407.5	3.0	7.7

TABLE 3.1: CONTINUED

21225	Q2	2558	6.7	383.1		
	Q100	58922	12.8	4588.0	1.9	12.0
21020	Q2	2558	2.4	1063.6		
	Q100	58922	9.1	6445.3	3.8	6.1
20845	Q2	2558	5.4	477.5		
	Q100	58922	12.1	4878.3	2.3	10.2
20595	Q2	2558	3.8	682.6		
	Q100	58922	9.3	6694.4	2.5	9.8
20435	Q2	2558	2.7	947.1		
	Q100	58922	9.4	6562.5	3.5	6.9
20280	Q2	2558	5.6	456.1		
	Q100	58922	13.7	4293.2	2.5	9.4
20070	Q2	2558	5.4	470.8		
	Q100	58922	17.4	3378.8	3.2	7.2
19855	Q2	2558	7.5	341.8		
	Q100	58922	13.9	4230.3	1.9	12.4
19630	Q2	2558	5.5	463.6		
	Q100	58922	10.6	5585.4	1.9	12.0
19440	Q2	2558	3.6	703.1		
	Q100	58922	8.5	6933.7	2.3	9.9
19240	Q2	2558	5.0	514.2		
	Q100	58922	10.4	5680.1	2.1	11.0
19050	Q2	2558	4.7	541.4		
	Q100	58922	8.3	7099.1	1.8	13.1
18830	Q2	2558	6.0	425.7		
	Q100	58922	11.7	5029.9	1.9	11.8
18650	Q2	2558	5.9	436.7		
	Q100	58922	9.4	6242.3	1.6	14.3
18475	Q2	2558	4.7	539.2		
	Q100	58922	8.4	7022.3	1.8	13.0
18290	Q2	2558	6.5	393.7		
	Q100	58922	8.9	6602.8	1.4	16.8
18025	Q2	2558	3.8	678.9		
	Q100	58922	6.4	9182.4	1.7	13.5
17785	Q2	2558	6.5	393.6		
	Q100	58922	7.2	8192.3	1.1	20.8
17510	Q2	2558	5.4	471.9		
	Q100	58922	10.5	5623.9	1.9	11.9
17360	Q2	2581	6.2	415.9		
	Q100	59457	13.1	4544.2	2.1	10.9
17110	Q2	2581	7.5	342.4		
	Q100	59457	18.4	3235.8	2.4	9.5
16970	Q2	2581	5.0	520.4		
	Q100	59457	13.4	4451.0	2.7	8.6
16720	Q2	2581	6.7	386.6		
	Q100	59457	15.4	3849.8	2.3	10.0
16515	Q2	2581	6.7	383.7		
	Q100	59457	10.9	5448.4	1.6	14.2
				MAXIMUM=	5.5	27.5
				MINIMUM=	0.8	4.2
				AVERAGE=	2.6	10.3

Table 3.2: Existing On-site Drainages and Runoff Quantities				
Sub basins	Area (AC)	Capital Storm Event		
		Time of Conc. (min)	Qbb (cfs)	Q/A (cfs/Ac)
100A	32.7	22	54	1.65
110A	49.6	20	87	1.75
200A	17.3	17	34	1.97
210A	35.8	25	55	1.54
400B	18.4	24	29	1.58
405B	38.9	29	54	1.39
408C	15.3	8	46	3.01
410C	44.3	19	81	1.83
415B	35.3	11	89	2.52
420A	34.4	25	53	1.54
425A	39.9	21	69	1.73
500A	26.5	20	47	1.77
510A	40.0	25	61	1.53
CTQ-1A	6.1	8	18	2.95
CTQ-2A	3.6	6	13	3.61
CTQ-3A	1.8	5	7	3.89
CTQ-4A	12.3	10	33	2.68
CTQ-5A	4.4	5	17	3.86
CTQ-6A	24.9	15	52	2.09
CTQ-7A	2.1	5	8	3.81
CTQ-8A	2.8	5	11	3.93
CTQ-9A	31.8	14	70	2.20
CTQ-10A	15.6	11	39	2.50
CTQ-11A	10.2	17	27	2.65
CTQ-12A	11.7	10	40	3.42
620A	12.4	23	20	1.61
Σ	568.1			

Notes:

bb: Burned and bulked flow

This was calculated by Sikand in the Newhall Ranch Specific Plan Master Hydrology and Drainage Concept, Date 3/14/05

Table 3.3: Existing Conditions River Discharge Stations 32265 to 22195 Downstream of Castaic Creek Confluence	
Recurrence Interval	**Flow (Discharge) Rate (cfs)**
2-Year[1]	2,527
5-Year[1]	8,232
10-Year[1]	14,942
20-Year[1]	24,157
50-Year[1]	41,141
100-Year[1]	58,207
Capital Flood[2]	163,000

[1]*Existing flows from United States Army Corps of Engineers, Santa Clara River Adopted Discharge Frequency Values. Adopted May 3, 1994 by the United States Army Corps of Engineers, the Ventura County Flood Control Department*

[2]*LADPW Published Capital Flood Design Flows*

3.1.2 On-Site Drainages

Flows discharge from the Project to the River from six on-site areas (18 sub-basins). The acreage for each of the existing drainage subbasins is provided in Table 3.2. There are currently no existing drainage or erosion/sedimentation control improvements located within the Project site other than existing minor agricultural drainage ditches and an insignificant amount of earthen River bank protection. The Chiquita Landfill drainage drains through the Project site and this man-made, open drainage would be put into pipe upon completion of the Project. However, the Project is not proposing to drain into this channel and, therefore, it would remain a separate, unmodified discharge.

Project Site runoff quantities for the Capital Flood for each of the six existing drainages defined by Psomas are provided in Table 3.2. Under existing conditions, combined flows from the Project site to the River total 1,823 cfs. Existing flow rates from observed data for the River at the Project site during 2-, 5-, 10-, 20-, 50-, and 100-year storm events are compiled in Table 3.3.

3.1.3 Off-Site Drainages

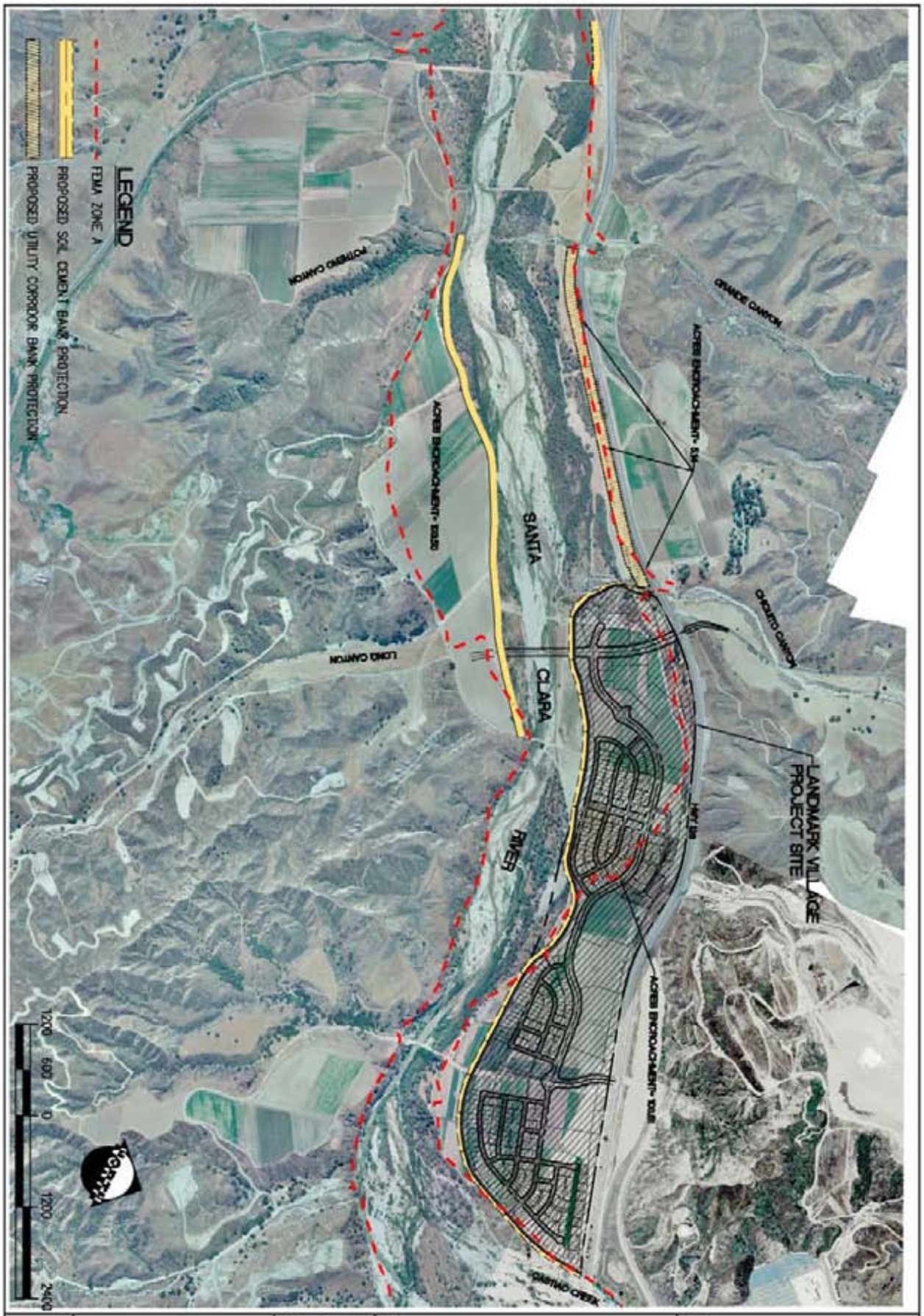
The total contributing drainage area that drains through the Project site is approximately 996 acres (Psomas, Landmark Village Drainage Concept Report). This runoff flows to and through the Project site via sheet flows and natural concentrated flows. The Capital Flood on the River is approximately 163,000 cfs at the Castaic Creek confluence. The Project site peak existing (burned and bulked) flow rate is approximately 1,660 cfs. Therefore, Capital Flood flows from the Project site are approximately one percent of the River Capital Flood discharge rate.

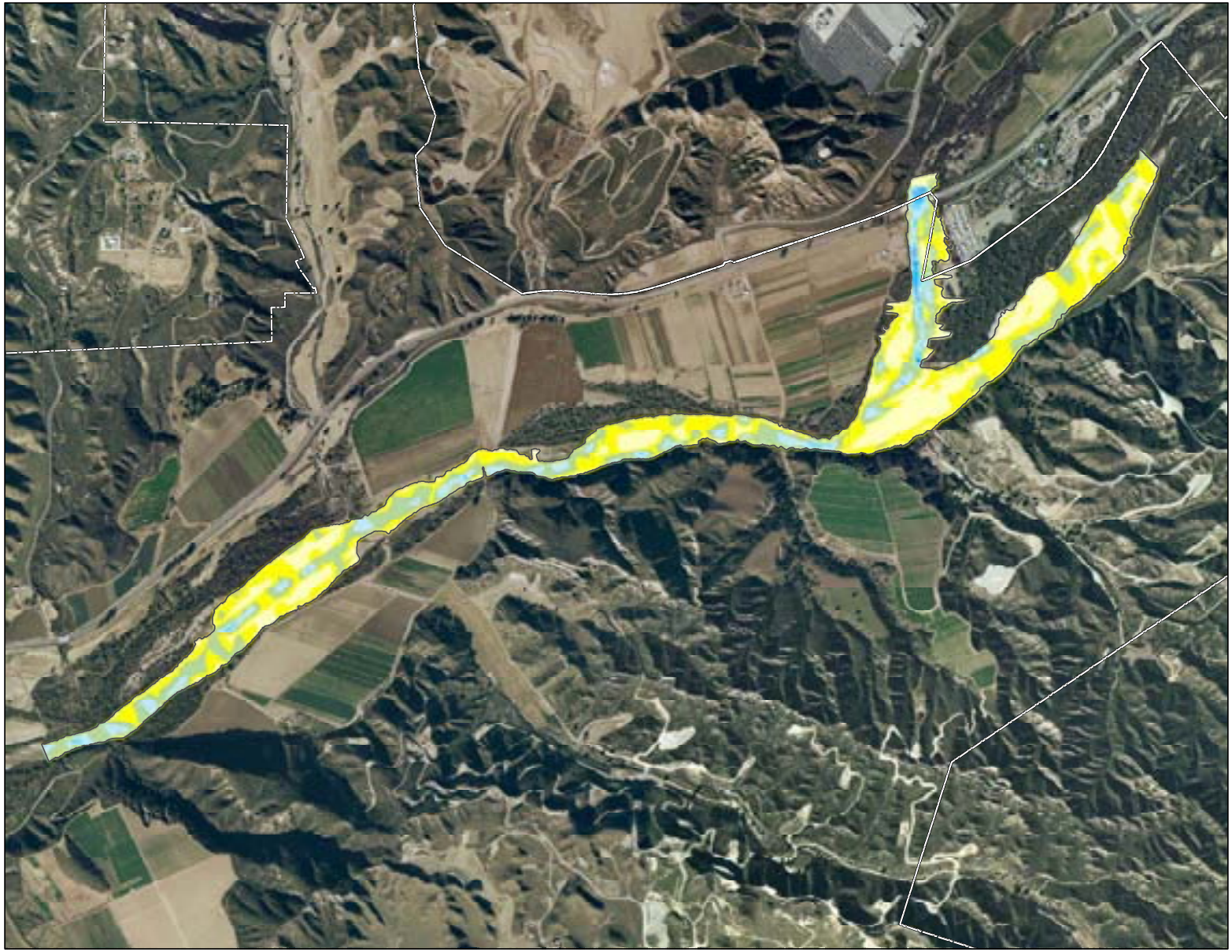
In addition to the 996 acre drainage area, there are four jurisdictional drainages located in the vicinity of the Project, excluding the Santa Clara River. These include Castaic Creek, Chiquito Canyon Creek, San Martinez Grande Canyon Creek and Potrero Canyon Creek.

3.2 Flood Hazards

A portion of the Project site lies within the 100-year floodplain of the River and within the FEMA 100-year floodplain identified by FEMA Flood Insurance Rate Map (FIRM) No. 065043-0340 (October 20, 2002) for the unincorporated areas of Los Angeles County. The FEMA 100-year floodplain is shown in Figure 3.1, and the FIRM is included in the Appendix. The 100-year floodplain boundaries are based on historical runoff records as measured with stream gauges. Mapping the 100-year floodplain is important because FEMA and the Federal Insurance Administration (FIA) use it to establish standards for flood insurance coverage. Under FIA criteria, the 100-year flood elevation is the "base flood" and any land that is outside of this 100-year, or base flood, elevation would be considered reasonably safe and free from flood hazard.

Table 3.4 shows the areas of each existing floodplain and stream for seven storm events. The existing velocities for the 2-, 5-, 10-, 20-, 50- and 100-year flood events are shown in Figures 3.2A through 3.2F.


LEGEND
FEMA ZONE A
PROPOSED SOIL CEMENT BANK PROTECTION
PROPOSED UTILITY CORRIDOR BANK PROTECTION
ROTRAMO CANYON
LONG CANYON
SANTA CLARA RIVER
ACRES ENCROACHMENT- 13.50
ACRES ENCROACHMENT- 5.94
ACRES ENCROACHMENT- 10.08
GRANDE CANYON
CHOUTO CANYON
LANDMARK VILLAGE PROJECT SITE
HWY 126
SANTA CLARITA
1200 600 0 1200 2400
FIGURE 3.1
PACE
PACIFIC ADVANCED CIVIL ENGINEERING
SCALE 1" = 1200'
DESIGNED DJ
DRAWN JCP
CHECKED MDK
DATE 04-26-05
JOB NO.
JOB LANDMARK VILLAGE
SANTA CLARITA CA
TITLE FEMA FLOOD PLAIN



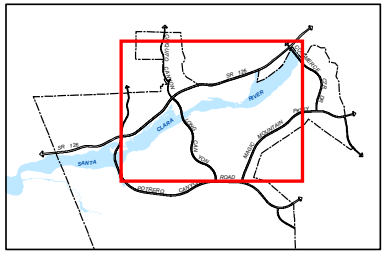
NEWHALL RANCH
Newhall Ranch Company

L E G E N D

Newhall Ranch Specific Plan Boundary

Velocity Profile (fps)

- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39

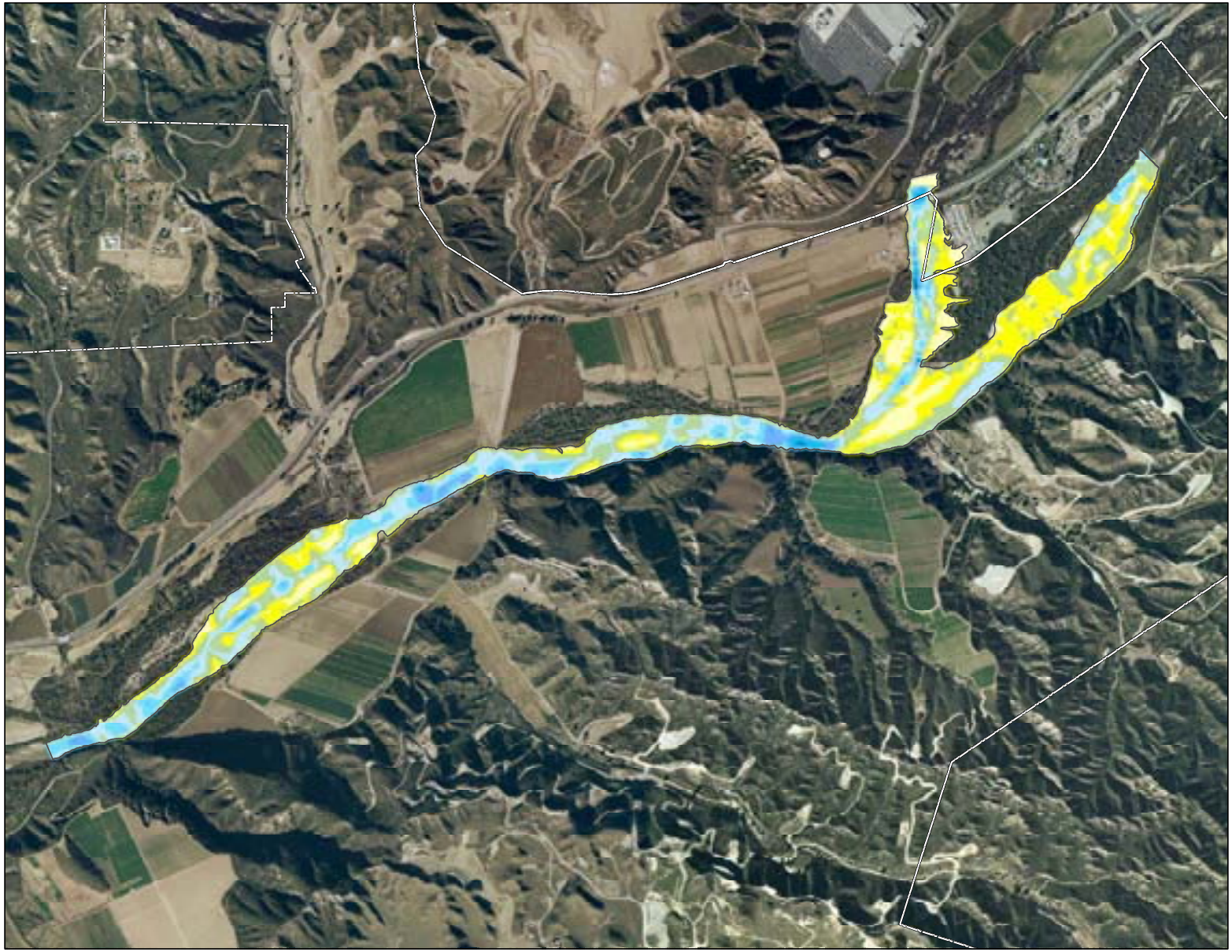


700 350 0 700 Feet
210 105 0 210 Meters

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure 3.2A
EXISTING VELOCITIES
2 YEAR FLOOD EVENT
LANDMARK VILLAGE

FILE: \\pacefs01\projects\8238\GIS\mxds\existing\8238E_rv-noleve_2yr_fs02305.mxd



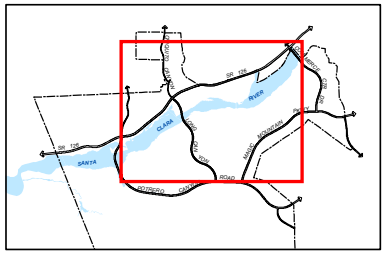
NEWHALL RANCH
Newhall Ranch Company

L E G E N D

Newhall Ranch Specific Plan Boundary

Velocity Profile (fps)

- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39

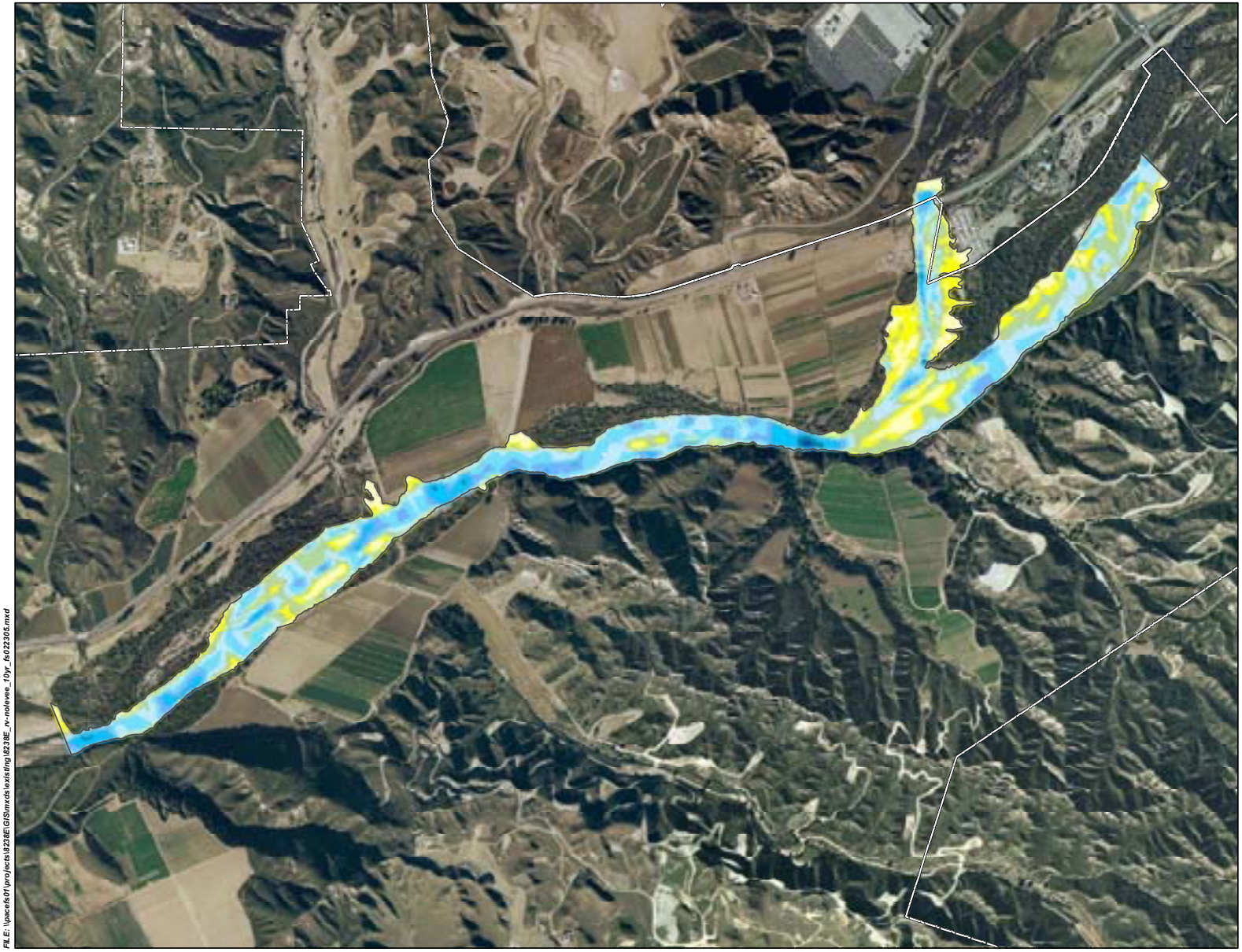


Feet: 700 350 0 700
Meters: 210 105 0 210

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure 3.2B
EXISTING VELOCITIES
5 YEAR FLOOD EVENT
LANDMARK VILLAGE

FILE: \\pace\fs01\projects\8238\GIS\mxd\existing8238E_rv=olleve_5yr_fx022105.mxd



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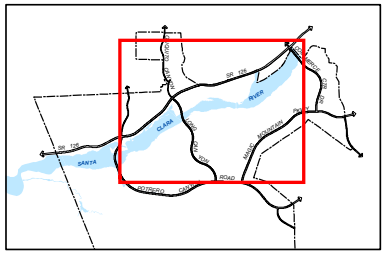
NEWHALL RANCH
Newhall Ranch Company

L E G E N D

Newhall Ranch Specific Plan Boundary

Velocity Profile (fps)

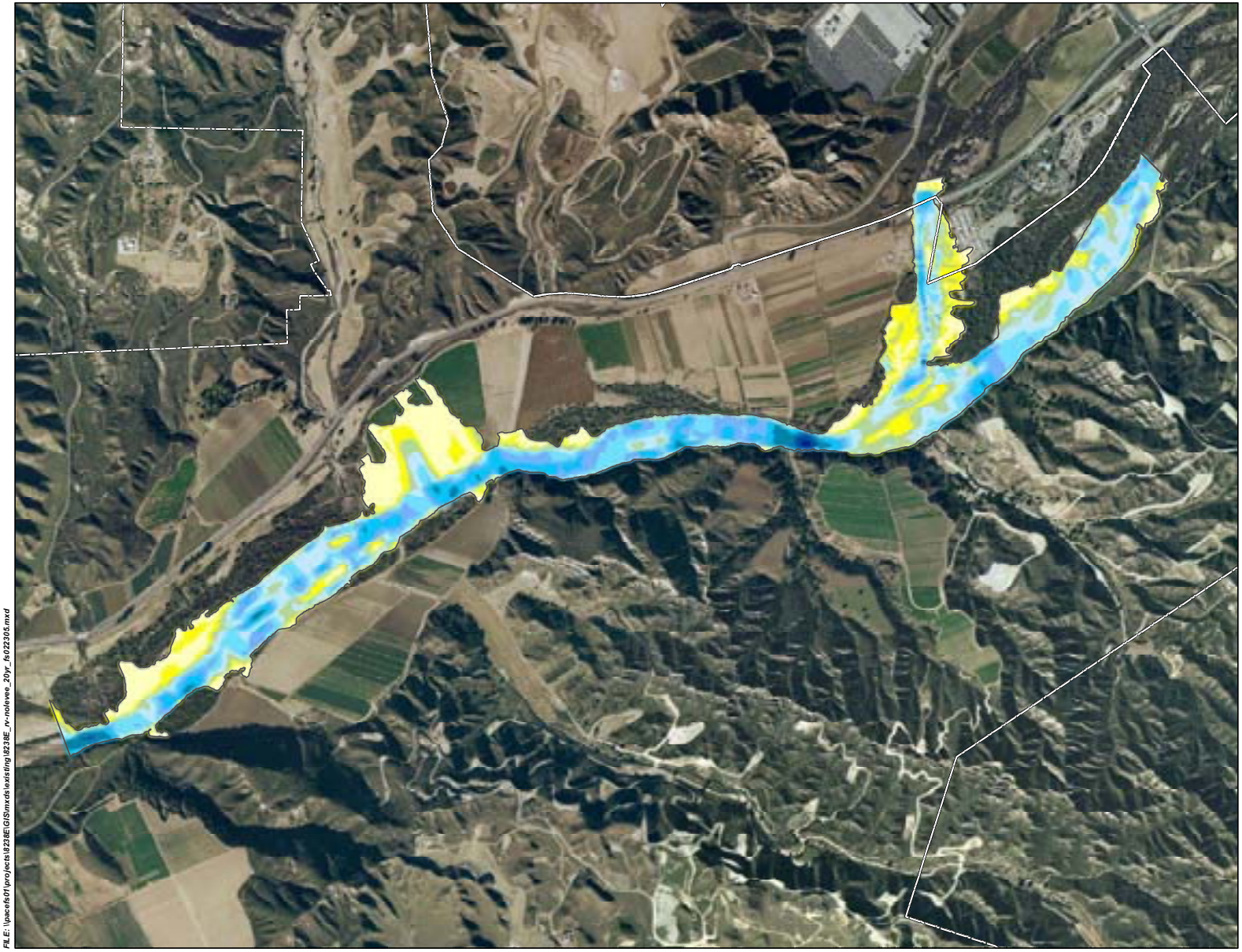
- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39



Feet: 700 350 0 700
Meters: 210 105 0 210

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure 3.2C
EXISTING VELOCITIES
10 YEAR FLOOD EVENT
LANDMARK VILLAGE



FILE: \\pacefs01\projects\8238E\GIS\mxds\existing\8238E_rv-nolevee_20yr_fs02230S.mxd

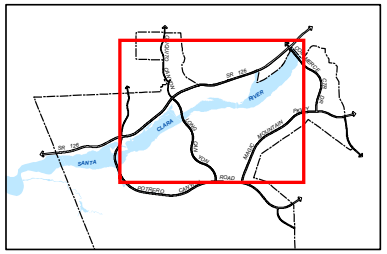
NEWHALL RANCH
Newhall Ranch Company

L E G E N D

Newhall Ranch Specific Plan Boundary

Velocity Profile (fps)

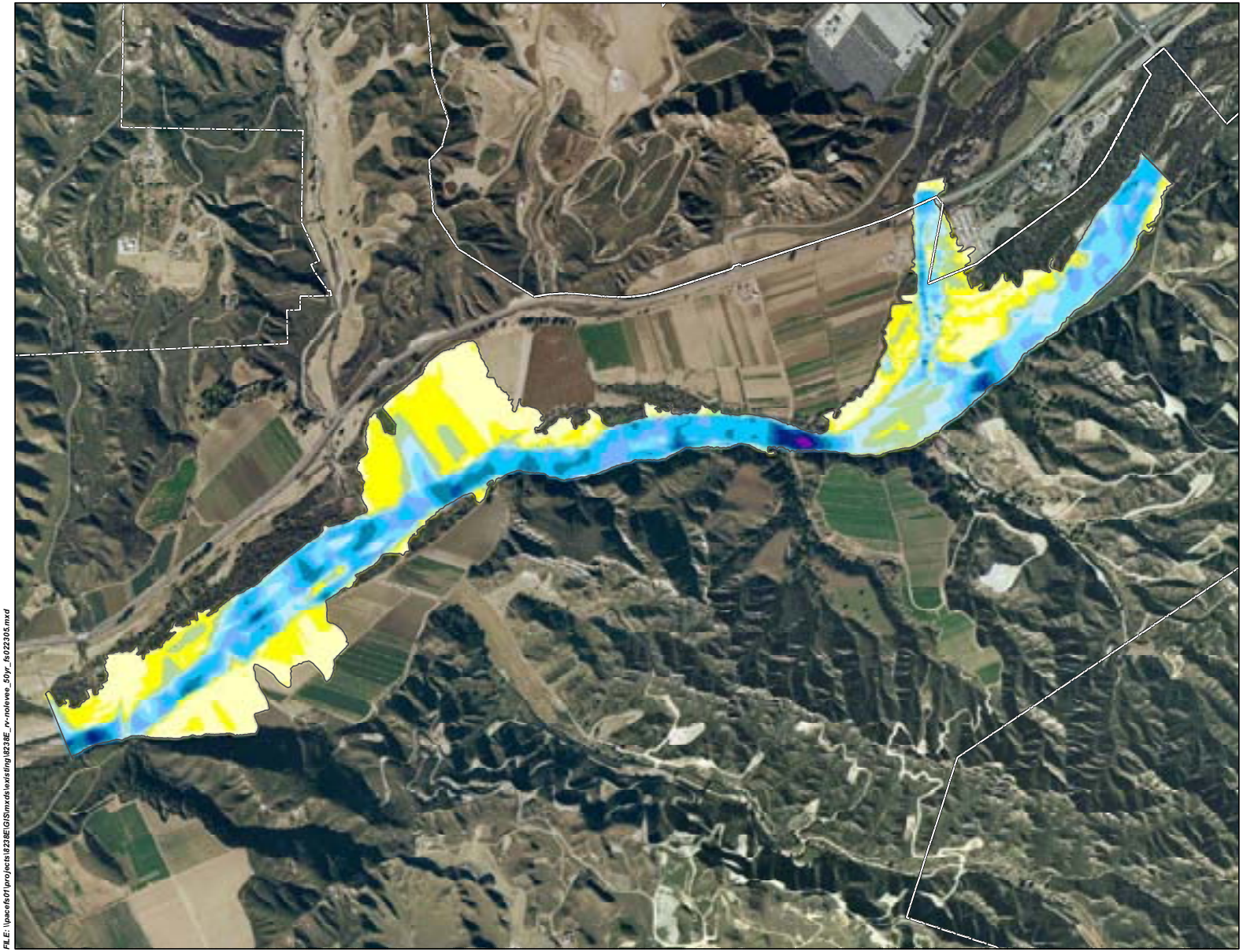
- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39



Feet: 700 350 0 700
Meters: 210 105 0 210

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure 3.2D
EXISTING VELOCITIES
20 YEAR FLOOD EVENT
LANDMARK VILLAGE



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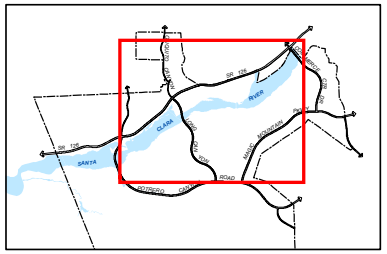
NEWHALL RANCH
Newhall Ranch Company

L E G E N D

Newhall Ranch Specific Plan Boundary

Velocity Profile (fps)

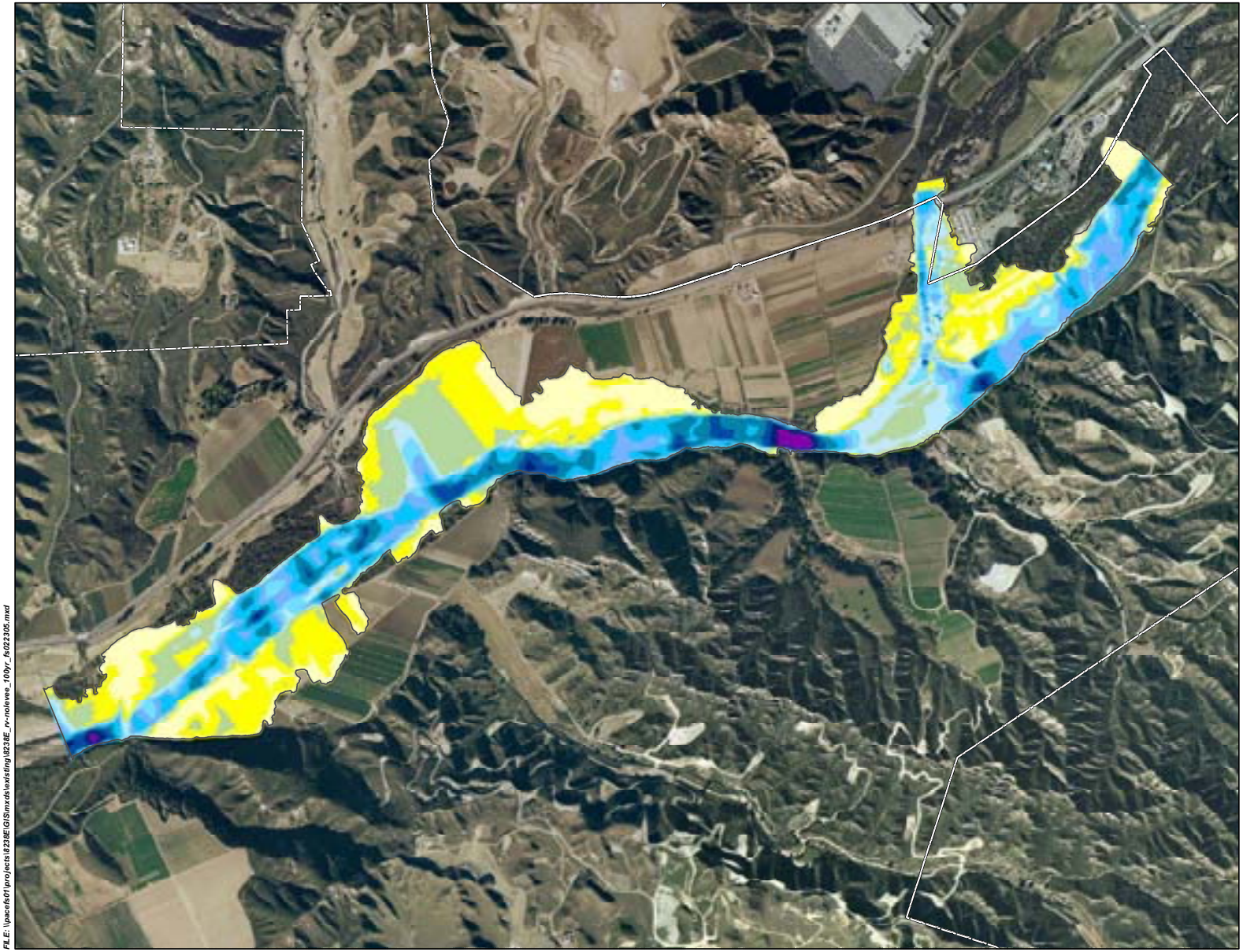
- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39



Feet: 700 350 0 700
Meters: 210 105 0 210

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure 3.2E
EXISTING VELOCITIES
50 YEAR FLOOD EVENT
LANDMARK VILLAGE



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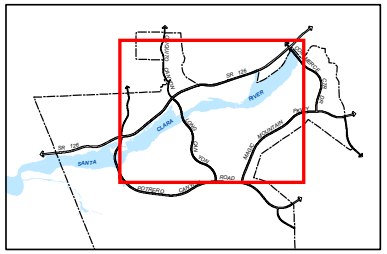
NEWHALL RANCH
Newhall Ranch Company

L E G E N D

Newhall Ranch Specific Plan Boundary

Velocity Profile (fps)

- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39



Feet: 700 350 0 700
Meters: 210 105 0 210

Figure 3.2F
EXISTING VELOCITIES
100 YEAR FLOOD EVENT
LANDMARK VILLAGE

Table 3.4: Floodplain Area for Difference Discharges – Existing Conditions		
	Acreage of Floodplain that is Flooded	
Flood Event (years)	From Commerce Center Drive to Ventura County Line	From Ventura County Line to a Point Four Miles Downstream in Ventura County
2	246	86
5	309	131
10	361	160
20	482	199
50	664	257
100	766	298

3.3 Channel and Floodplain Conditions

The difference in elevation between the active channel bottom and the 100-year floodplain along the margins of the River varies greatly at the Project site. This difference ranges from approximately 4.3 to 16.3 feet and is dependent upon the width of the River channel at a particular location. For example, in wider portions of the River channel where flows widen with corresponding low velocities, there is only a small elevation difference between the channel bottom and the adjacent floodplain boundary. In contrast, the channel is often deep where it is narrower, creating a large elevation difference between the channel bottom and the floodplain boundary.

The existing River channel contains a variety of vegetation types. The active River channel is mostly barren due to annual scouring. However, vegetation types on the adjacent terraces vary based on elevation relative to the active channel bottom and the frequency of flooding. The following series of vegetation types occur along a vertical gradient from the channel bottom to the highest River terrace on the floodplain: emergent herbaceous, woody shrubs, and trees.

The substrate of the River channel (i.e., top layer of the River bottom) is primarily sand, which is actively eroded and deposited in flood events. Previous studies (Simons and Li) by the Los Angeles County Flood Control District have demonstrated that sediment deposition and scouring along the upper Santa Clara River are generally in equilibrium, and that there are no major trends of channel degradation or aggradation. However, some localized areas may experience either greater scouring or deposition.

4 Project Conditions

The impacts of Project implementation are discussed below. In summary, the Project includes the construction of approximately 17,700 LF of soil cement, which is primarily necessary to protect the Project's residential and commercial development and the Long Canyon Road Bridge, as well as the property immediately downstream of the Project from potential erosion due to Project implementation. In addition, approximately, 4,700 LF of TRMs would be installed downstream of the Project site along the northern edge of the River corridor to protect the utility corridor from Chiquito Canyon to San Martinez Grande Canyon (stations STA 22195 and STA 17510). The impacts of installing bank protection, bridge piers and abutments (Long Canyon Road Bridge) and erosion protection along the River are analyzed in this section. This analysis focuses on the Project's hydrologic and hydraulic impacts on the River.

4.1 Alteration of Existing Drainage Patterns

4.1.1 Santa Clara River

The River will be encroached upon with the placement of the buried soil cement, TRMs, bridge abutments and piers, storm drain outlets and energy dissipaters proposed by the Project. Project impacts are expected to include habitat removal and disturbance, localized erosion, localized increased sedimentation, and habitat modification as a result of changes to River velocity and water surface elevation due to Project improvements. The Project will not impact overall discharge in the River because no discharge is diverted from or to the River as a result of the Project (Table 4.1). Therefore, no impacts will occur as a result of discharge changes.

Table 4.1: Project-Related Changes in Discharge Below the Specific Plan Site

Location - Downstream of the Specific Plan Site Below RS 15125	Discharge for Different Return Periods (cfs)					
	2-year	5-year	10-year	20-year	50-year	100-year
Existing Conditions	2,600	8,480	15,400	24,900	42,400	60,000
Proposed Conditions	2,600	8,480	15,400	24,900	42,400	60,000
Net Change	0	0	0	0	0	0

Source: Sikand Engineering (2000b). The above noted changes are considered to be "conservative" in that the predicted discharges under proposed conditions do not include the effect of the timing of flows from the Specific Plan site, which would reduce th

Impacts associated with erosion and sediment deposition and, therefore, streambed modification within the River are evaluated as a function of in-stream velocities, which are indicators for potential riverbed scouring. This is discussed in detail in Section 4.5.1. The total area of floodplain where discharge velocities would be over 4 fps during a 100-year storm would also be decreased by 126.7 acres as a result of the proposed Project. Table 4.2 provides a summary of floodplain acreage (by vegetation type) where Project-related increases or decreases in discharge velocities in excess of 4 fps would occur. In total, the area of floodplain subject to flows in excess of 4 fps would be reduced by

CHANGE IN FLOODPLAIN AREA WHERE VELOCITY >4fps BY VEGETATION TYPE

2 YEAR - Floodplain Overall Vegetation

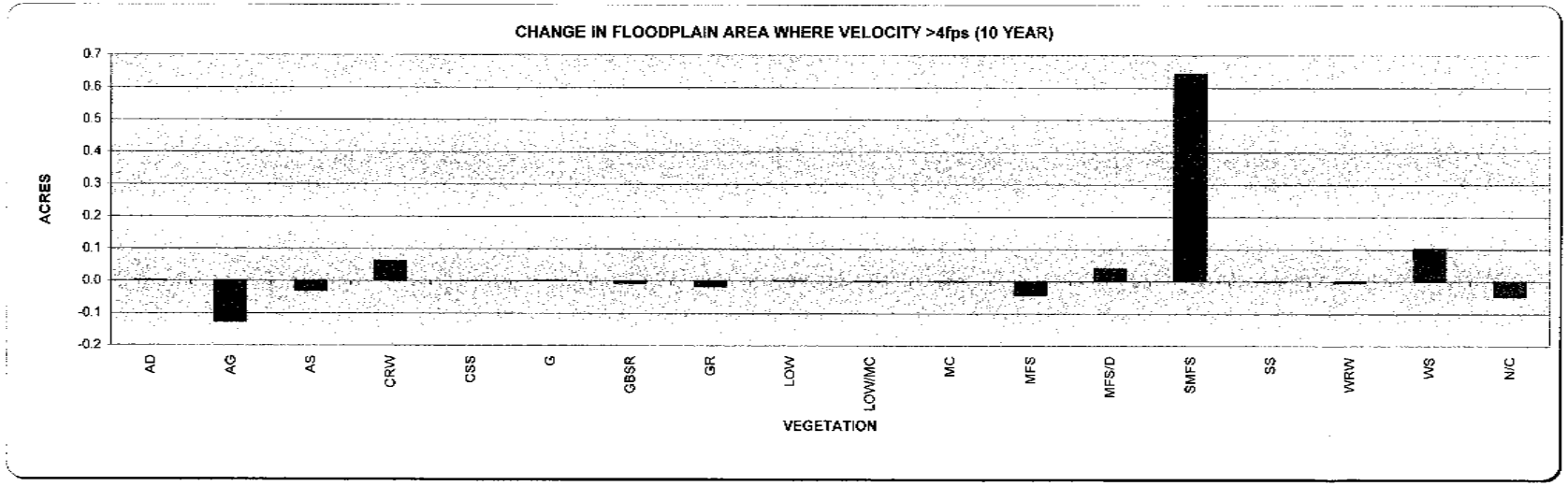
Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	0.0	0.0	0.0	0.0%
AG	1.8	1.8	0.0	0.0%
AS	1.0	1.0	0.0	0.0%
CRW	2.6	2.6	0.0	0.0%
CSS	0.0	0.0	0.0	0.0%
G	0.0	0.0	0.0	0.0%
GBSR	0.0	0.0	0.0	0.0%
GR	0.0	0.0	0.0	0.0%
LOW	0.0	0.0	0.0	0.0%
LOW/MC	0.0	0.0	0.0	0.0%
MC	0.0	0.0	0.0	0.0%
MFS	0.1	0.1	0.0	0.0%
MFS/D	0.0	0.0	0.0	0.0%
SMFS	70.1	70.1	0.0	0.0%
SS	0.0	0.0	0.0	0.0%
WRW	0.0	0.0	0.0	0.0%
WS	1.2	1.2	0.0	0.0%
N/C	3.5	3.5	0.0	0.0%
<=4 FPS	167.6	167.6	0.0	0.0%
TOTAL	248.0	248.0	0.0	0.0

5 YEAR - Floodplain Overall Vegetation

Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	0.0	0.0	0.0	0.0%
AG	2.4	2.4	0.0	0.0%
AS	1.6	1.6	0.0	0.0%
CRW	4.2	4.2	0.0	0.0%
CSS	0.0	0.0	0.0	0.0%
G	0.0	0.0	0.0	0.0%
GBSR	0.0	0.0	0.0	0.0%
GR	0.1	0.1	0.0	0.0%
LOW	0.0	0.0	0.0	0.0%
LOW/MC	0.0	0.0	0.0	0.0%
MC	0.0	0.0	0.0	0.0%
MFS	0.3	0.3	0.0	0.0%
MFS/D	0.0	0.0	0.0	0.0%
SMFS	157.1	157.1	0.0	0.0%
SS	0.0	0.0	0.0	0.0%
WRW	0.2	0.2	0.0	0.0%
WS	2.4	2.4	0.0	0.0%
N/C	4.1	4.1	0.0	0.0%
<=4 FPS	97.0	97.0	0.0	0.0%
TOTAL	269.5	269.5	0.0	0.0%

10 YEAR - Floodplain Overall Vegetation

Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	0.0	0.0	0.0	72.0%
AG	3.1	2.9	-0.1	-4.1%
AS	1.7	1.7	0.0	-1.7%
CRW	4.0	4.0	0.1	1.6%
CSS	0.0	0.0	0.0	-1.6%
G	0.1	0.1	0.0	3.8%
GBSR	0.0	0.0	0.0	-18.4%
GR	0.2	0.2	0.0	-7.5%
LOW	0.0	0.0	0.0	3.7%
LOW/MC	0.0	0.0	0.0	-40.0%
MC	0.0	0.0	0.0	-100.0%
MFS	0.6	0.6	0.0	-6.7%
MFS/D	0.0	0.1	0.0	99.5%
SMFS	196.0	196.6	0.6	0.3%
SS	0.0	0.0	0.0	-100.0%
WRW	0.6	0.6	0.0	-0.6%
WS	3.8	3.9	0.1	2.7%
N/C	4.0	4.0	0.0	-1.2%
<=4 FPS	68.6	66.5	-2.1	-3.1%
TOTAL	282.9	281.4	-1.5	-0.5%



Rive: Village Velocity-Vegetation Impacts Stats_Rev 3-23-05

Figure 4.1A

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CHANGE IN FLOODPLAIN AREA WHERE VELOCITY >4fps BY VEGETATION TYPE

20 YEAR - Floodplain Overall Vegetation

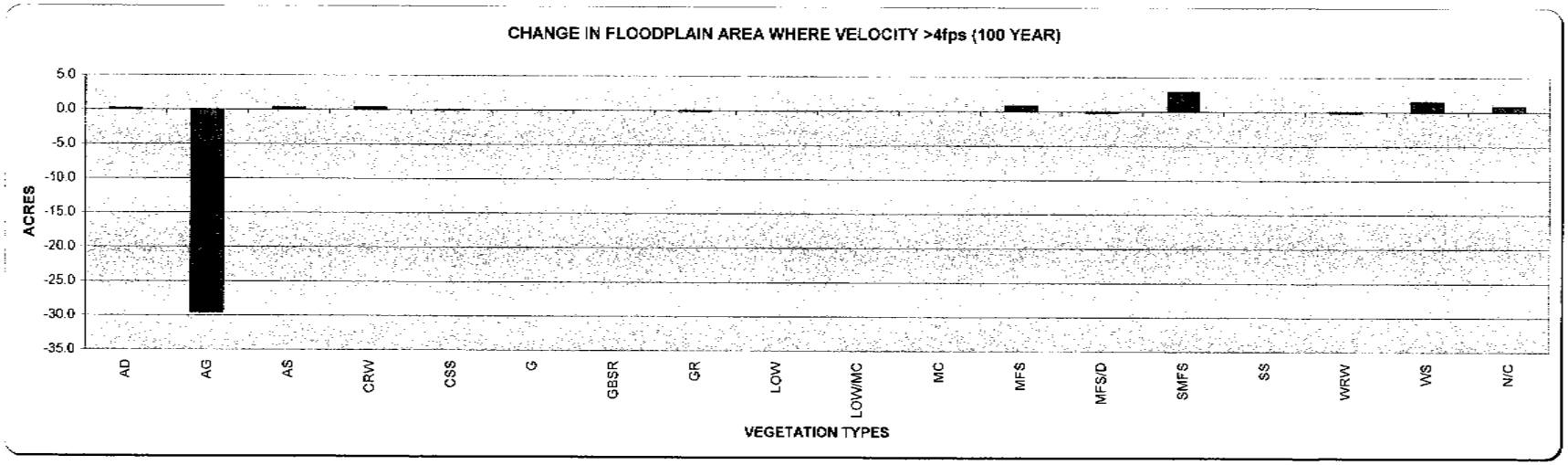
Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	0.0	0.0	0.0	3.9%
AG	9.6	5.0	-4.6	-48.2%
AS	2.2	2.3	0.0	1.5%
CRW	5.5	5.6	0.1	1.6%
CSS	0.0	0.0	0.0	-20.7%
G	0.1	0.1	0.0	-6.2%
GBSR	0.0	0.0	0.0	-10.3%
GR	0.4	0.4	0.0	-1.9%
LOW	0.1	0.1	0.0	-7.2%
LOW/MC	0.0	0.0	0.0	160.7%
MC	0.0	0.0	0.0	-100.0%
MFS	1.3	1.4	0.1	4.5%
MFS/D	0.1	0.2	0.1	68.5%
SMFS	215.2	215.7	0.5	0.2%
SS	0.0	0.0	0.0	0.0%
WRW	1.4	1.6	0.2	17.4%
WS	5.3	5.4	0.1	1.7%
N/C	4.6	4.6	0.0	1.0%
<=4 FPS	112.5	82.0	-30.5	-27.1%
TOTAL	358.4	324.3	-34.0	-9.5%

50 YEAR - Floodplain Overall Vegetation

Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	0.1	0.1	0.0	11.4%
AG	18.3	12.0	-6.3	-34.5%
AS	3.5	4.0	0.4	12.6%
CRW	8.7	9.3	0.5	5.8%
CSS	0.1	0.1	0.0	37.6%
G	0.2	0.2	0.0	-0.2%
GBSR	0.1	0.1	0.0	13.0%
GR	1.1	1.0	-0.1	-4.9%
LOW	0.1	0.1	0.0	21.7%
LOW/MC	0.0	0.0	0.0	36.5%
MC	0.0	0.0	0.0	4.3%
MFS	3.0	3.1	0.1	3.4%
MFS/D	0.3	0.4	0.1	15.2%
SMFS	229.4	232.1	2.8	1.2%
SS	0.0	0.0	0.0	60.0%
WRW	3.0	3.0	0.0	1.5%
WS	8.4	8.7	0.3	3.6%
N/C	6.1	7.3	1.2	20.6%
<=4 FPS	205.2	113.6	-91.6	-44.6%
TOTAL	487.6	395.1	-92.4	-19.0%

100 YEAR - Floodplain Overall Vegetation

Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	0.1	0.3	0.2	114.9%
AG	50.4	20.9	-29.6	-58.7%
AS	5.1	5.4	0.3	5.5%
CRW	14.0	14.4	0.3	2.5%
CSS	0.2	0.1	-0.1	-33.1%
G	0.2	0.2	0.0	-2.9%
GBSR	0.2	0.2	0.0	-0.8%
GR	1.8	1.6	-0.1	-6.9%
LOW	0.1	0.2	0.0	5.3%
LOW/MC	0.0	0.0	0.0	433.3%
MC	0.0	0.0	0.0	-9.9%
MFS	4.4	5.2	0.8	17.5%
MFS/D	1.3	1.1	-0.2	-14.4%
SMFS	236.6	239.5	2.9	1.2%
SS	0.0	0.0	0.0	1.9%
WRW	5.0	4.8	-0.2	-3.3%
WS	11.4	12.8	1.4	12.5%
N/C	7.0	7.8	0.8	11.6%
<=4 FPS	226.1	128.1	-98.0	-43.3%
TOTAL	564.1	442.7	-121.4	-21.5%



River Village Velocity Vegetation Impacts Stats_Rev 3-23-06

Figure 4.1B

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approximately 0.0, 0.0, 1.5, 34.0, 92.4 and 121.4 acres as a result of the proposed Project during the 2-, 5-, 10-, 20-, 50- and 100-year storm events, respectively. Figure 4.1a-4.1b shows that the largest reductions in floodplain acreage with flows in excess of 4 fps would be on land presently used for agricultural purposes and that is proposed for conversion to residential and commercial uses.

Finally, increases in velocity in excess of 4 fps would occur downstream of the Project site. In total, the area of floodplain subject to velocities in excess of 4 fps would be reduced by approximately 0.0, 0.0, 1.5, 34.0, 92.4 and 121.4 acres as a result of the proposed Project during the 2-, 5-, 10-, 20-, 50- and 100-year storm events, respectively. Such increases have the potential of causing erosion. However, the Project-related increases in velocity downstream of the Project site would be mitigated by installation of buried soil cement bank protection on the southern edge of the River corridor from the Long Canyon Road Bridge to Station No. 17510.

As expected, Table 4.3 shows that during the 100-year storm event, Project-related improvements would result in 31 locations where there is an increase in water surface elevation (10 of which exceed one foot) and 21 locations where there is a decrease in water surface elevations (one of which exceeds one foot). All of these increases are localized. Additionally, no impacts to water surface elevation will occur upstream or downstream of the Project.

TABLE 4.2: CHANGE (PROPOSED-EXISTING) IN ACREAGE OF VEGETATION BY TYPE EXPOSED TO VELOCITIES > 4FPS BY RETURN PERIOD

Vegetation	2-YR	5-YR	10-YR	20-YR	50-YR	100-YR
AD	0.0	0.0	0.0	0.0	0.0	0.0
AG	1.8	0.0	2.4	0.0	-0.1	0.0
AS	1.0	0.0	1.6	0.0	0.0	0.0
CRW	2.6	0.0	4.2	0.0	0.1	0.0
CSS	0.0	0.0	0.0	0.0	0.0	0.0
G	0.0	0.0	0.0	0.0	0.0	0.0
GBSR	0.0	0.0	0.0	0.0	0.0	0.0
GR	0.0	0.0	0.1	0.0	0.0	0.0
LOW	0.0	0.0	0.0	0.0	0.0	0.0
LOW/MC	0.0	0.0	0.0	0.0	0.0	0.0
MC	0.0	0.0	0.0	0.0	0.0	0.0
MFS	0.1	0.0	0.3	0.0	0.0	0.0
MFS/D	0.0	0.0	0.0	0.0	0.0	0.0
SMFS	70.1	0.0	157.1	0.0	0.6	0.0
SS	0.0	0.0	0.0	0.0	0.0	0.0
WRW	0.0	0.0	0.2	0.0	0.0	0.0
WS	1.2	0.0	2.4	0.0	0.1	0.0
N/C	3.5	0.0	4.1	0.0	0.0	0.0
SUBTOTAL	**80.4**	**0.0**	**0.7**	**0.0**	**-1.0**	**-23.5**
<4 FPS	167.6	0.0	97.0	0.0	-2.1	0.0
TOTAL	248.0	0.0	97.7	0.0	-3.1	-23.5

AG Agricultural and Other Developed Use
AD Agricultural Drain
AS Alluvial Scrub
CRW Southern Cottonwood/Willow Riparie
CRWU Southern Cottonwood/Willow Upland
CSS Coastal Sage Scrub
ES Elderberry Scrub
G Grassland
G/D Disturbed Grassland
GBSR Riparian Great Basin Scrub
GR Riparian Grassland
LOW Live Oak Woodland
LOW/MC Live Oak Woodland/Mixed Chaparral
MC Mixed Chaparral
MFS Mule Fat Scrub
MFS/D Disturbed Mule Fat Scrub
SMFS Successional Mule Fat Scrub
SS Scalebroom Scrub
WRW Southern Willow Riparian Woodland
WS Southern Willow Scrub
N/C Not Coded

TABLE 4.3: EXISTING AND PROPOSED WATER SURFACE ELEVATION BY STATION FOR THE 100 YEAR DISCHARGE, SANTA CLARA RIVER STATIONS STA 35245 TO STA 14315

River Station	Existing	Proposed	Δ	River Station	Existing	Proposed	Δ	River Station	Existing	Proposed	Δ	River Station	Existing	Proposed	Δ
35245	976.0	976.0	0.0	29140	948.3	948.3	0.0	24115	913.2	914.5	1.3	19240	885.7	886.4	0.6
35040	974.4	974.4	0.0	28995	946.2	946.3	0.1	23975	911.9	913.2	1.3	19050	885.4	886.2	0.8
34860	973.6	973.6	0.0	28895	937.5	937.5	0.0	23755	911.3	911.7	0.3	18830	884.0	884.3	0.2
34720	971.8	971.8	0.0	28800	935.2	935.2	0.0	23555	910.0	911.0	0.9	18650	883.7	883.7	-0.1
34495	969.9	969.9	0.0	28280	932.8	932.8	0.0	23365	908.1	909.7	1.6	18475	883.5	883.4	-0.1
34310	967.6	967.6	0.0	28080	933.1	933.1	0.0	23180	908.1	908.5	0.4	18290	882.9	882.8	-0.2
34090	967.5	967.5	0.0	27925	933.9	933.9	0.0	23000	907.0	908.4	1.4	18025	882.7	882.7	0.0
33880	966.4	966.4	0.0	27725	932.1	932.1	0.0	22790	906.1	906.2	0.2	17785	882.2	882.2	-0.1
33710	965.5	965.5	0.0	27545	930.9	930.8	0.0	22600	905.6	905.5	-0.1	17510	880.6	880.6	0.0
33500	964.4	964.4	0.0	27335	928.7	928.7	0.0	22415	905.2	903.1	-2.0	17360	879.2	879.2	0.0
33310	962.7	962.7	0.0	27155	929.5	929.6	0.1	22195	903.0	902.8	-0.3	17110	874.9	874.9	0.0
33115	960.3	960.3	0.0	26990	928.7	928.6	0.0	22010	900.8	900.7	-0.1	16970	875.3	875.3	0.0
32795	960.8	960.8	0.0	26780	925.6	925.6	0.0	21790	898.8	898.8	0.0	16720	870.9	870.9	0.0
32505	959.7	959.7	0.0	26575	926.5	926.6	0.0	21615	898.8	898.7	-0.1	16515	870.5	870.5	0.1
32255	959.3	959.3	0.0	26355	925.5	925.3	-0.2	21440	896.5	898.2	1.6	16305	867.8	867.6	-0.1
31875	956.9	957.0	0.0	26170	924.1	924.1	0.1	21225	896.9	896.6	-0.3	16130	868.1	868.1	0.0
31585	954.4	954.4	0.0	25965	924.7	924.5	-0.1	21020	892.7	896.2	3.5	15960	867.4	867.4	0.0
31390	951.6	951.6	0.0	25785	922.8	923.2	0.4	20845	894.1	894.7	0.5	15745	866.7	866.7	0.0
31050	949.8	950.0	0.2	25600	921.9	921.5	-0.4	20655	893.9	894.7	0.9	15540	866.0	865.9	-0.1
30720	950.2	950.2	0.0	25425	920.3	920.5	0.2	20435	893.7	894.5	0.7	15335	864.3	865.0	0.7
30445	950.2	950.1	0.0	25215	920.4	919.6	-0.8	20280	892.4	892.3	0.0	15125	860.8	862.4	1.6
30085	950.0	950.0	0.0	25000	918.2	918.3	0.1	20070	888.6	888.7	0.1	14900	860.8	860.7	-0.1
29815	949.8	949.8	0.0	24795	917.0	918.3	1.3	19855	888.1	887.9	-0.3	14720	859.4	859.4	0.0
29555	949.7	949.7	0.0	24550	914.7	916.6	2.0	19630	886.5	887.6	1.1	14480	858.6	858.5	-0.1
29385	949.3	949.3	0.0	24335	915.3	914.7	-0.6	19440	887.1	887.5	0.3	14315	857.8	857.7	-0.1

MAX=	3.5
MIN=	-2.0

4.1.2 On-site drainage

Implementation of the Project (with the associated storm drain system) would affect the previously described on-site natural tributary drainage channels. While existing discharges from the Project site are not concentrated into centralized outlet structures (as proposed by the Project), surface water flows naturally form paths of least resistance and concentrate at existing topographic depressions or cut channels that serve as concentrated discharge locations. Therefore, while the Project includes development of the storm drain system and will have predefined outlets, this condition will not significantly alter existing drainage patterns. The Project also includes the use of energy dissipaters at the storm drain outlets to the River. Installation of these improvements will dissipate the energy that could cause erosion at the Project outlets.

The Psomas Drainage Concept compares the existing and proposed developed condition hydrology, and concludes that a net decrease of Q_{CAP}=-267 *cfs* is expected to occur in the proposed Project condition, as presented in Table 4.4. The apparent cause of the reduction of the peak discharge is a function of the reduction of the time of concentration for the project. That is, the increase in imperviousness reduces the time of concentration for various subbasins. As a result the hydrograph of water discharged from the Project site is flatter and broader, reducing the peak. This small change (<1%) shows that the existing and proposed Project condition are substantially consistent. It is important to note that the existing condition is the 50-year burned and bulked discharge, also defined as the Capital discharge. The proposed Project condition, in contrast, is the burned and unbulked discharge. In the proposed Project condition, water from off-site discharging through the Project will pass through sediment basins that act to remove or unbulk sediment from the water. While the volume of water is the same for both the existing condition and proposed Project condition, the existing condition discharge is laden with sediment while the proposed Project condition discharge has had sediment removed.

Table 4.4: Existing vs. Proposed Condition On-site Hydrology Comparison 50-Year Event (CFS)

Existing[1]	Proposed[2]	Δ
1117	850	-267

1. Burned and bulked 2. Burned or Design

4.1.3 Proposed Floodplain Modifications

4.1.3.1 Consistency with the Newhall Ranch EIR

The Newhall Ranch Specific Plan utilized innovative techniques to meet the requirements of flood control while maintaining the natural resources within the Santa Clara River. The Project will implement these techniques as part of its flood control improvements. Traditional flood

control techniques in use in Los Angeles County rely on reinforced concrete or grouted rock rip-rap to minimize erosion while maximizing the volume of flood flows carried by the drainage. While exceedingly efficient as a flood control technique, this approach retains none of the natural resource value.

In contrast, the Conceptual Backbone Drainage Plan of the Newhall Ranch Specific Plan provides drainage and flood control protection to developed uses while preserving the River as a natural resource. The Drainage Plan utilizes several criteria that are to be implemented by projects that develop within the Specific Plan area. The primary criteria are as follows:

- Flood corridor must allow for the passage of Los Angeles County Capital Flood discharge without the permanent removal of natural River vegetation (except at bridge crossings);

- The banks of the River will generally be established outside of the "waters of the United States" as defined by federal laws and regulations and as determined by the delineation completed by the ACOE in August 1993;

- Where the ACOE delineation width is insufficient to contain the Capital Flood flow, the flood corridor will be widened by an amount sufficient to carry the Capital Flood flow without the necessity of permanently removing vegetation or significantly increasing velocity; and

- Soil cement will occur only where necessary to protect against erosion adjacent to the proposed development. Where existing bluffs are determined to be stable and there is no adjacent proposed development, no bank protection will be built.

The improvements proposed by the Project are consistent with these criteria. Most of the flood protection associated the Project is buried bank stabilization to stabilize River and creek banks. As illustrated in this report, the design and location of the flood protection improvements is sufficient to carry the Capital Flood discharge and adheres to FEMA requirements. The location of areas where soil cement would be provided is depicted on Figure 1.4 and, in most cases, is outside of the ACOE jurisdictional limits. Finally, only areas where flood protection is necessary are proposed for improvements.

At limited locations on the Project site, such as at outlet structures, access ramps, or bridge abutments, grouted rip-rap or reinforced concrete would be used to minimize erosion. In the Project area, approximately 63 percent of the River corridor would be protected with flood protection improvements, while 37 percent of the River corridor would remain in a natural state. Approximately 76 percent of the area proposed for flood protection improvements would consist of buried bank

RIVER VILLAGE VELOCITY/VEGETATION IMPACTS STATISTICS

Flood Plain Area Analysis

Flood Frequency	Existing Area	Proposed Area	Delta	Delta
YR	(AC)	(AC)	(AC)	%
2	248.0	248.0	0.0	0.0%
5	269.5	269.5	0.0	0.0%
10	282.9	281.4	-1.5	-0.5%
20	358.4	324.3	-34.1	-9.5%
50	487.6	395.1	-92.5	-19.0%
100	564.1	442.7	-121.4	-21.5%

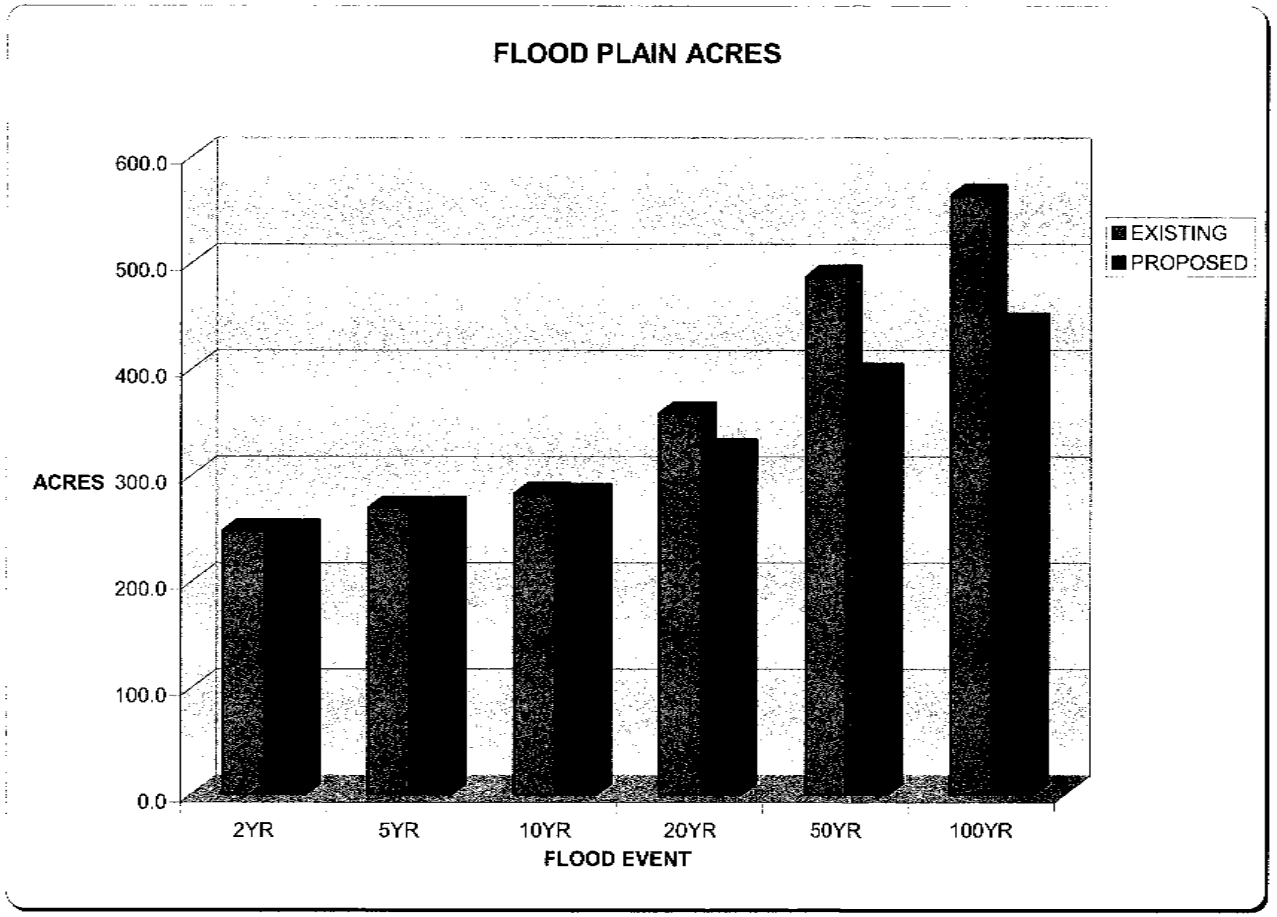


Figure 4.2

stabilization. Approximately 20 percent would consist of TRM's (those areas along the utility corridor). Approximately 4 percent would consist of rip-rap or reinforced concrete (primarily at Long Canyon Bridge and SR 126 over Castaic Creek).

Buried soil cement, now employed on numerous projects within the Santa Clarita Valley, is a modern flood control technique used to protect against erosion while maintaining natural vegetation and soft banks. Figure 1.5 depicts a typical cross-section for buried soil cement. As shown, this approach uses soil cement, primarily consisting of on-site materials, generally installed in locations set back from the riparian corridor, which is then buried and re-vegetated with native plant species. This type of flood protection allows for the creation of a large river corridor with significant buffers, which maintains the natural habitat presently found along the River.

In conclusion, this report confirms the project's consistency with the Newhall Ranch Specific Plan.

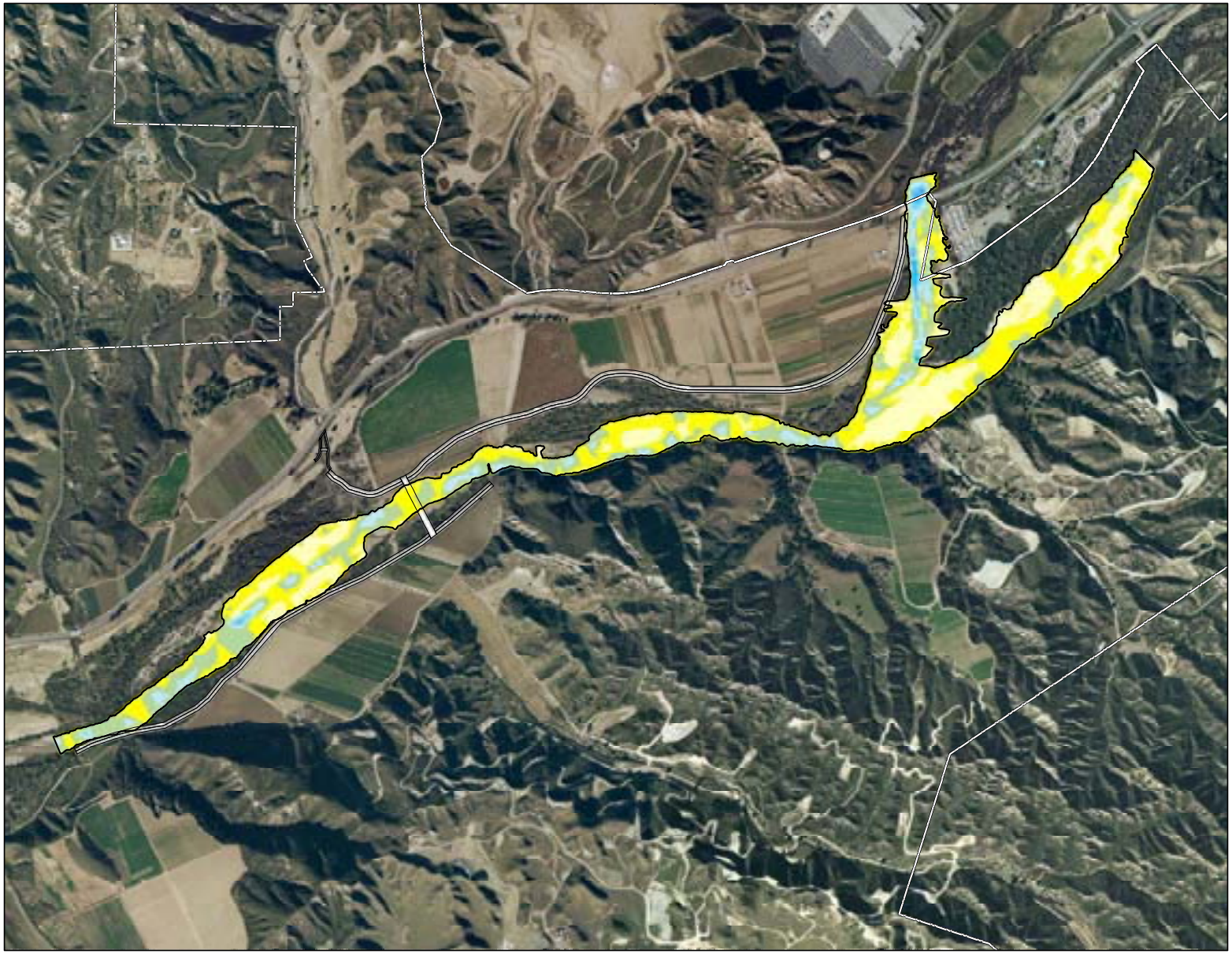
4.1.3.2 Modification of County Floodway Map/Consistency with County Capital discharge requirements

Los Angeles County has mapped the 100-year floodplain and flood way for the River under its Q_{CAP} requirements. All projects developed within the unincorporated areas of the County of Los Angeles are required to comply with the County's Q_{CAP} requirements. The project design is consistent with the Capital discharge requirements since design modeling is based on the Capital discharge. Finally, if the Project is approved at the project-level, the County's Map Floodway will be changed to correspond with Project improvements.

4.1.3.3 FEMA 100-Year Floodplain

The Project would necessitate encroachments into the existing FEMA 100-year floodplain. These encroachments were all discussed in detail in the Newhall Ranch Specific Plan EIR. These encroachments would require FEMA review and approval in the form of the Conditional Letter of Map Revision/Letter of Map Revision (CLOMR/LOMR) floodplain map revision process. Approximately 327 acres of the Project development acreage is within the existing FEMA 100-year floodplain. In summary, the FEMA 100-year floodplain line corresponds to an existing elevation where flooding could occur in a 100-year storm. To meet the FEMA requirements, the Project proposes the raising of the development footprint to an elevation above the existing FEMA maximum flooding elevation. Additionally, the Project incorporates bank stabilization along the River corridor to protect the site from erosion.

Encroachment impacts were evaluated using floodplain and



NEWHALL RANCH
Newhall Ranch Company

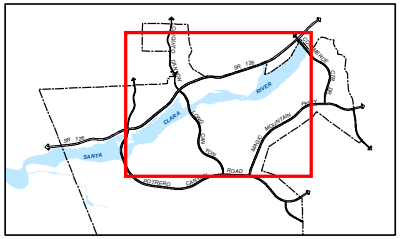
L E G E N D

Newhall Ranch Specific Plan Boundary

Bank Stabilization

Velocity Profile (fps)

- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39

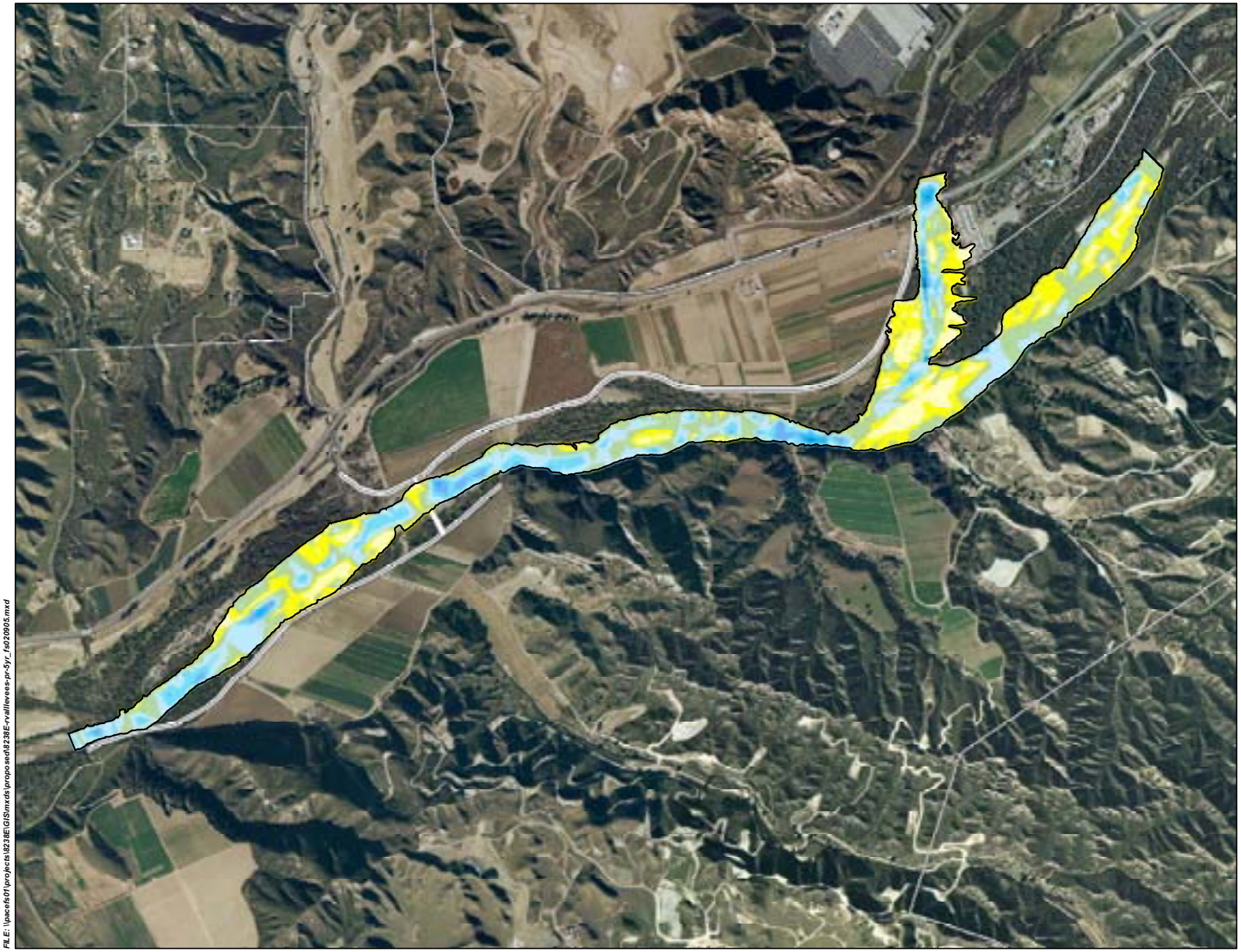


Feet: 0 350 700 1,400
Meters: 0 105 210 420

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure 4.3A
PROPOSED CONDITIONS
2 YEAR FLOOD EVENT
LANDMARK VILLAGE

FILE: \\pacefs01\projects\8238E\GIS\mxds\proposed\8238E-vallevees-pr-2yr_fs020905.mxd



NEWHALL RANCH
Newhall Ranch Company

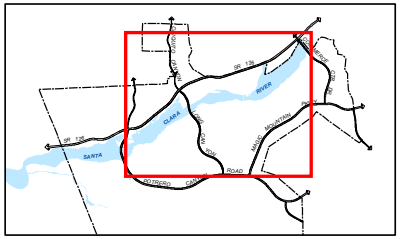
L E G E N D

Newhall Ranch Specific Plan Boundary

Bank Stabilization

Velocity Profile (fps)

- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39

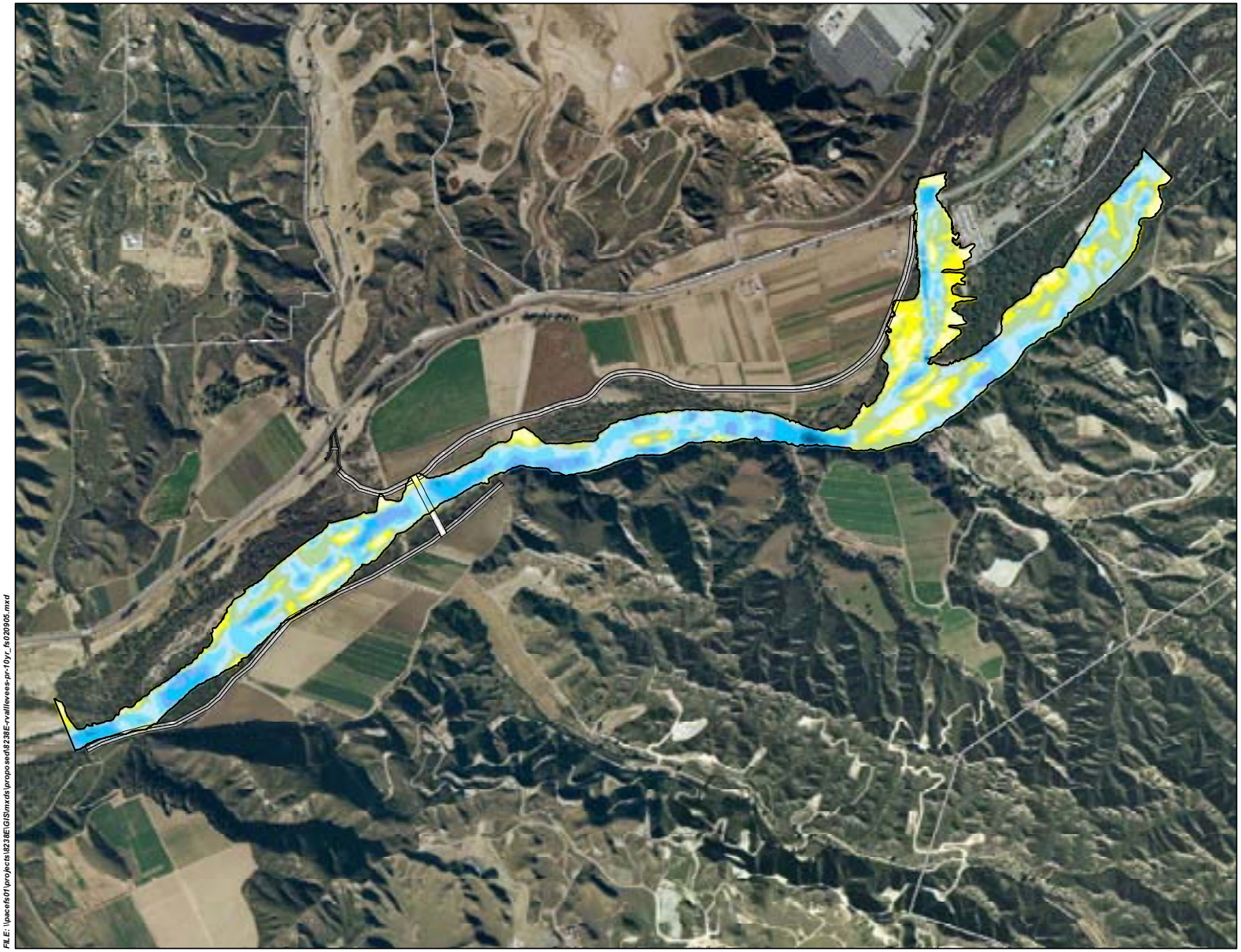


Feet: 700 350 0 700
Meters: 210 105 0 210

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure 4.3B
PROPOSED CONDITIONS
5 YEAR FLOOD EVENT
LANDMARK VILLAGE

FILE: \\pacefs01\projects\8238E\GIS\mxds\proposed\8238E-rvallevees-pr-5yr_fs020905.mxd



NEWHALL RANCH
Newhall Ranch Company

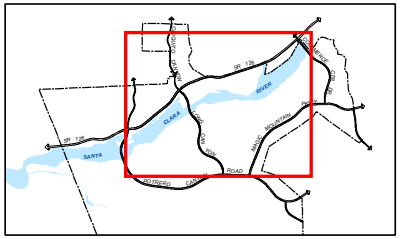
L E G E N D

Newhall Ranch Specific Plan Boundary

Bank Stabilization

Velocity Profile (fps)

- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39

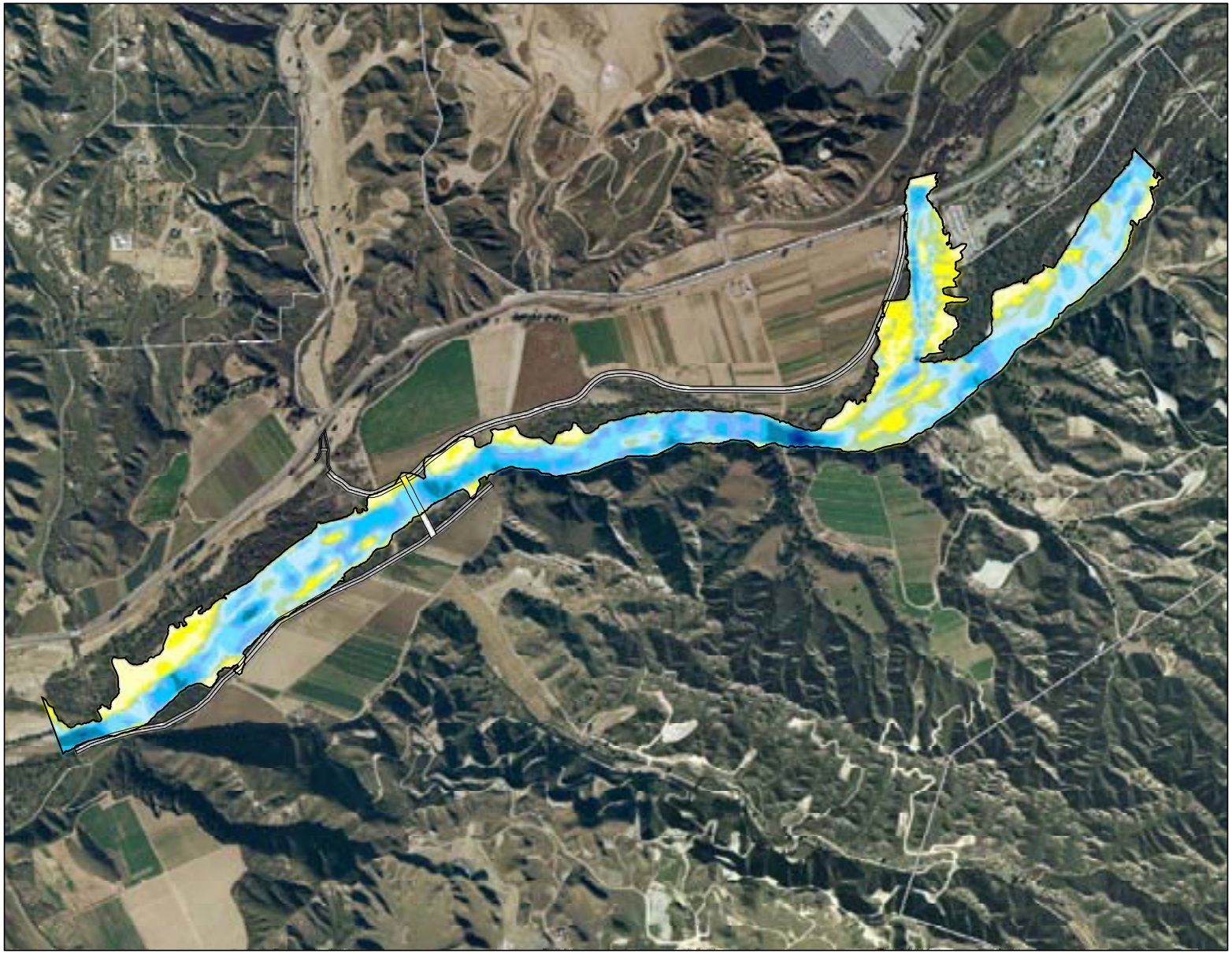


Feet: 700 350 0 700
Meters: 210 105 0 210

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure 4.3C
PROPOSED CONDITIONS
10 YEAR FLOOD EVENT
LANDMARK VILLAGE

FILE: \\pacefs01\projects\8238E\GIS\mxds\proposed\8238E-valleyees-pr-10yr_fs020905.mxd



NEWHALL RANCH
Newhall Ranch Company

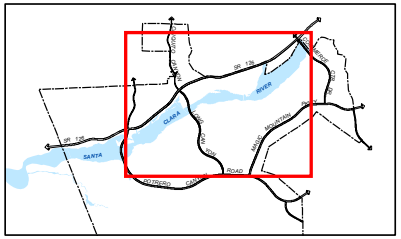
L E G E N D

Newhall Ranch Specific Plan Boundary

Bank Stabilization

Velocity Profile (fps)

- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39

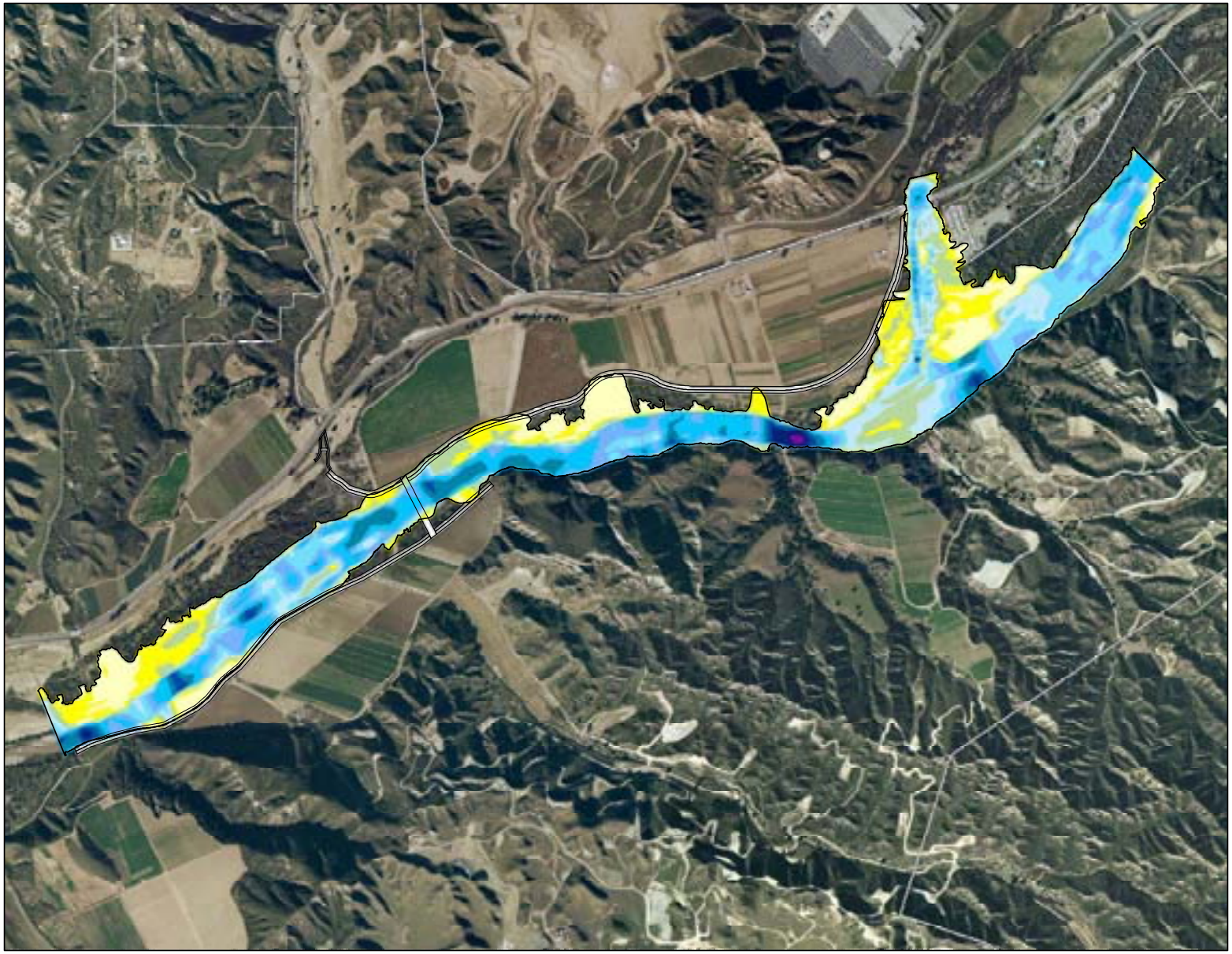


700 350 0 700 Feet
210 105 0 210 Meters

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure 4.3D
PROPOSED CONDITIONS
20 YEAR FLOOD EVENT
LANDMARK VILLAGE

FILE: \\pacefs01\projects\8238E\GIS\mxds\proposed\8238E-rvallevees-pr-20yr_fs020905.mxd



NEWHALL RANCH
Newhall Ranch Company

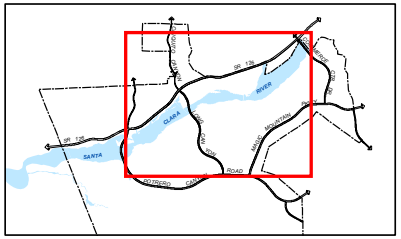
L E G E N D

Newhall Ranch Specific Plan Boundary

Bank Stabilization

Velocity Profile (fps)

- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39

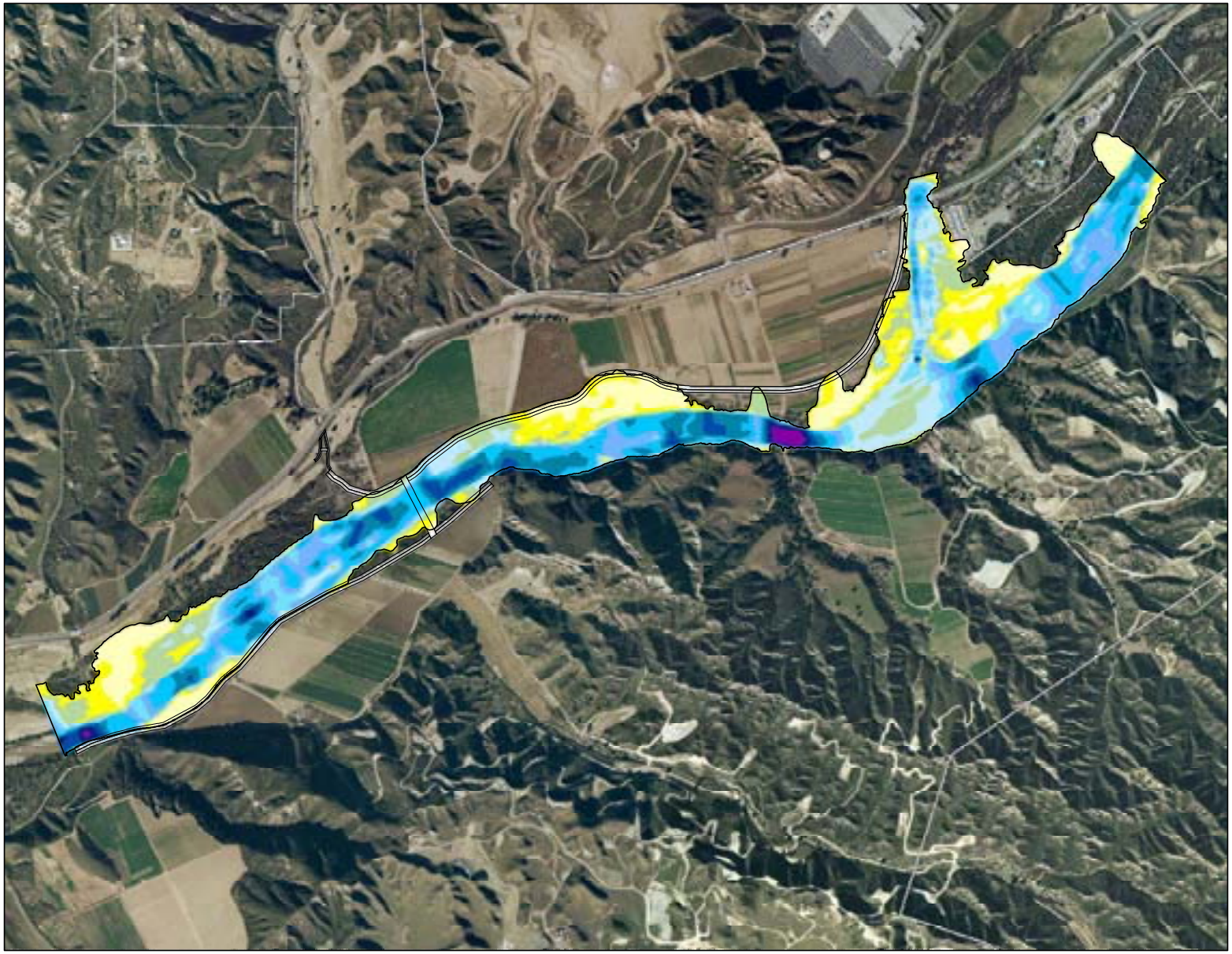


700 350 0 700 Feet
210 105 0 210 Meters

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure 4.3E
PROPOSED CONDITIONS
50 YEAR FLOOD EVENT
LANDMARK VILLAGE

FILE: \\pacefs01\projects\8238E\GIS\mxds\proposed\8238E-rvallevees-pr-50yr_fs020905.mxd



NEWHALL RANCH
Newhall Ranch Company

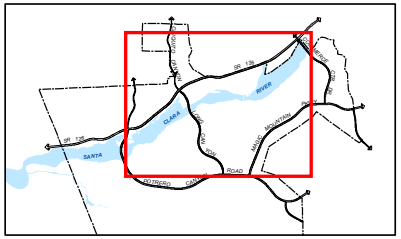
L E G E N D

Newhall Ranch Specific Plan Boundary

Bank Stabilization

Velocity Profile (fps)

- 0 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
- 25 - 27
- 28 - 30
- 31 - 39



700 350 0 700 Feet
210 105 0 210 Meters

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure 4.3F
PROPOSED CONDITIONS
100 YEAR FLOOD EVENT
LANDMARK VILLAGE

FILE: \\pacefs01\projects\8238E\GIS\mxds\proposed\8238E-vallevees-pr-100yr_fs020905.mxd

habitat engineering and analyzed on the basis of depth and velocity, as described below. Additionally, some banks located out of the floodplain will require stabilization because of the need to protect for the Q_{CAP} discharge.

The bank stabilization and erosion protection would provide adequate protection to the developed areas from flood hazards. Additionally, the locations and dimensions of this bank stabilization, erosion protection and bridge abutments are such that neither would impede or redirect flood flows within the River. Therefore, a modification to the FEMA flood hazard boundary is appropriate to correspond to the location of the flood protection improvements.

Finally, in most areas, the soil cement would be placed outside the existing River channel, creating areas that would convert to River channel or upland. For example, soil cement proposed on the north side of the River near the confluence with Castaic Creek would be constructed on agricultural land, north of the existing riparian or River corridor. The land located between the existing River corridor and the newly created stabilized and revegetated bank would be excavated to widen the existing River corridor, which would increase the area available within the corridor.

The Long Canyon Road Bridge is proposed to be constructed across the River, near the western end of the Project site at STA 22190 (Figure 1.4). Long Canyon Road Bridge is to include abutments, rip-rap transitions to soil cement, and approaches that would reduce the width of the 100-year floodplain. However, as summarized in Table 4.5, the existing active River channel width, which carries the 2- through 5-year flood events, would be completely spanned by the bridge and remain unaffected. The 10- through 100-year events would be impacted by the narrowing of the channel resulting in localized increases in velocity and water surface elevation necessitating the westerly extension of bank stabilization along the southern edge of the River corridor. This bank stabilization, located downstream from the residential and commercial areas of the Project site, is consistent with the bank stabilization improvements described in the Newhall Ranch Specific Plan. Finally, flooding up to and including the 100-year and Q_{CAP} events would be contained within the north and south bridge abutments.

Table 4.5: Pre- and Post-Development Floodplain/Stream Area			
Storm Event	Existing Conditions Acreage	Post Development Acreage	Δ (%)
2-Year	248.0	248.0	0.0
5-Year	269.5	269.5	0.0
10-Year	282.9	281.4	-0.5
20-Year	358.4	324.3	-10.5
50-Year	487.6	395.1	-23.4
100-Year	564.1	442.7	-27.4

4.2 Housing or Structures within a 100-Year Flood Hazard Area

Consistent with the approved Newhall Ranch Specific Plan, a portion of the project tract map site, which consists of residential lots, internal roads and other development, is within the existing FEMA 100-year floodplain (Figure 3.1). This portion of the proposed development is situated on existing agricultural lands within the floodplain area. However, this portion of the proposed development would be filled and, thereby elevated, so that the developed topography would no longer be within the existing FEMA 100-year floodplain. As additional flood protection, the Project's southern boundary proposes buried soil cement, which would stabilize the elevated bank and protect the proposed development from flood hazards. The buried soil cement is designed to act as a non-erodible boundary to contain flood waters during a Capital Flood discharge. Figure 3.1 illustrates the existing FEMA 100-year floodplain zone, proposed development within that area and the proposed soil cement bank protection.

Because a portion of the Project development is within the existing FEMA 100-year floodplain, adjustments to the FEMA published maps, (FIRMs), are required. These adjustments are administered by FEMA, and revisions to the mapping are made by applicants applying for a Letter of Map Revisions -- based on Fill (LOMR-F). LOMR-Fs are documents issued by FEMA that remove property and/or structures from special flood hazard areas. It is a common accepted practice, both nationwide and within Los Angeles County, to process revisions to the FEMA floodplain maps (*i.e.*, LOMR-Fs). The issuance of a LOMR-F would eliminate the property and/or structures from the applicable FEMA 100-year map. Any property and/or structures that are elevated above the FEMA 100-year floodplain zone are considered reasonably safe and free from flood hazard. Figure 4.4 depicts the proposed final FEMA 100-year floodplain zone, consistent with the proposed developed topography and soil cement bank protection.

The proposed Long Canyon Road Bridge would be constructed across the River, and would include piers, abutments and rip-rap within the FEMA 100-year floodplain area (Figure 3.1). However, as shown on Table 4.5, the existing active River channel width, which carries the 2- through 5-year flood events, would be completely spanned by the bridge and remain unaffected. During the 10- through 100-year flood events, the narrowing of the River channel width would result in localized increases in velocity and water surface elevation, which causes the need for the westerly extension of buried soil cement bank protection along the southern edge of the River corridor. This buried soil cement bank protection, located downstream from the Project tract map site, is consistent with the bank stabilization improvements described in the previously approved Newhall Ranch

Xrefs: 7841E-Plong_bridge.dwg; 7841-PSIRV.dwg; P-bank protection_REV.dwg; 7142-Lining.dwg; 7142-Flood Resource.dwg; 7142-river-sections1.dwg; NR-cdfg_2004.dwg; NR-acoe_2004.dwg; NR-Sec23.
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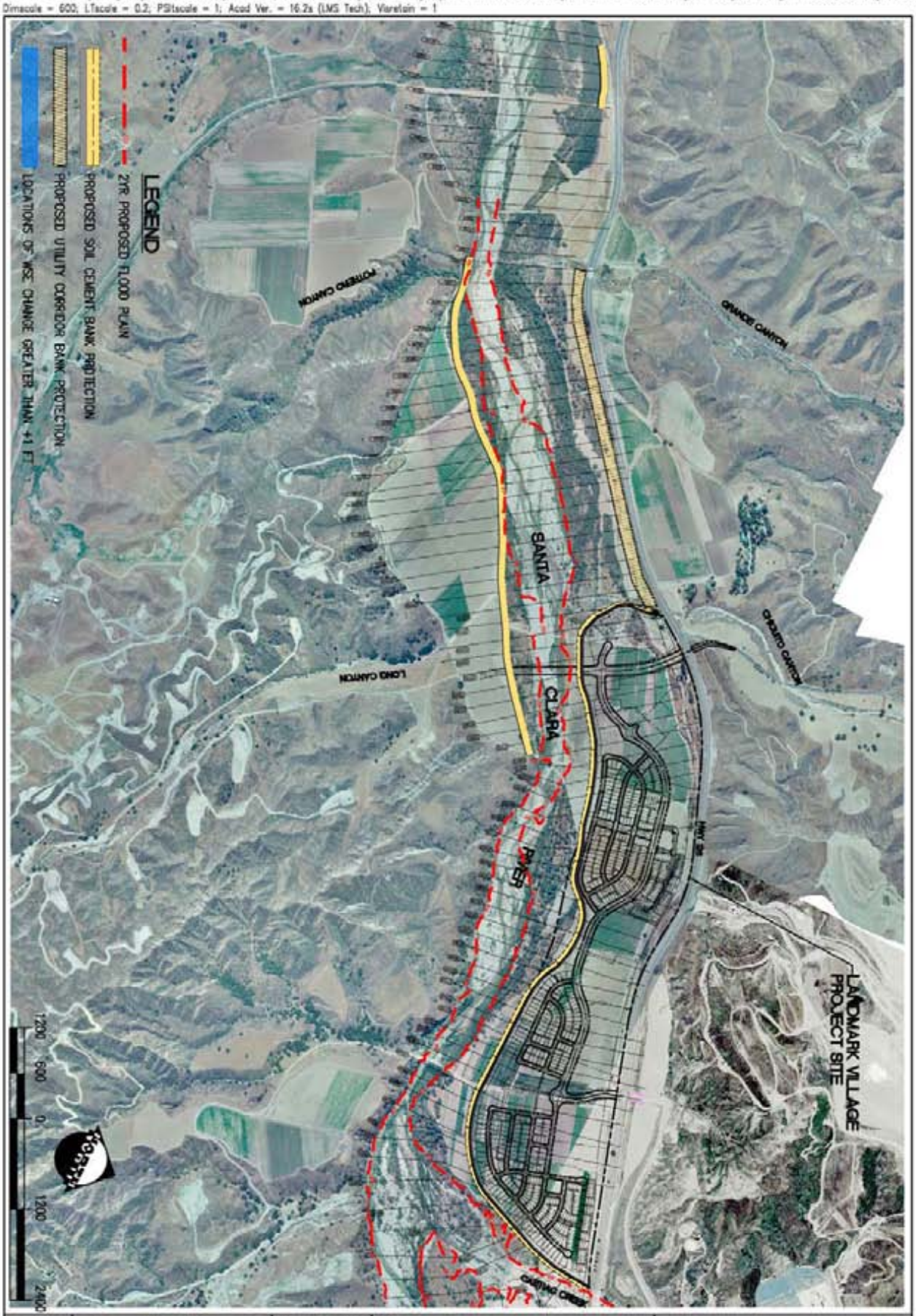


FIGURE 4.4A

PACE
PACIFIC ADVANCED CIVIL ENGINEERING
27201 TIERRA BLANCA, SUITE 200
FOUNTAIN VALLEY, CA 92708
PH (714) 961-2360 FAX (714) 961-2368

SCALE	1"= 1200'
DESIGNED	DJ
DRAWN	JFP
CHECKED	MCK
DATE	04-26-05
JOB NO.	7841-E

JOB
LANDMARK VILLAGE
SANTA CLARITA CA

TITLE
PROPOSED 2YR FLOOD PLAIN LOCATIONS WITH WSE CHANGE GREATER THAN 1 FT

P:\7841E\Engineering\GlobalExhibits\7841E-EX-PROP-COMPARISON-2YR-FIG 4.4A.dwg - Tab: 2YR PROP-FP By: ddrahn on Jun. 30, 2005 at 12:06 pm

Xrefs: 7841E-Plang_bridge.dwg; 7841-PSIRV.dwg; P-bank protection_REV.dwg; 7142-Lining.dwg; 7142-Flood Resource.dwg; 7142-river-sections1.dwg; NR-cdfg_2004.dwg; NR-acoe_2004.dwg; NR-Sec23.
Dimscale = 600; LTscale = 0.2; PSltscale = 1; Acad Ver. = 16.2s (LMS Tech); Varelsin = 1

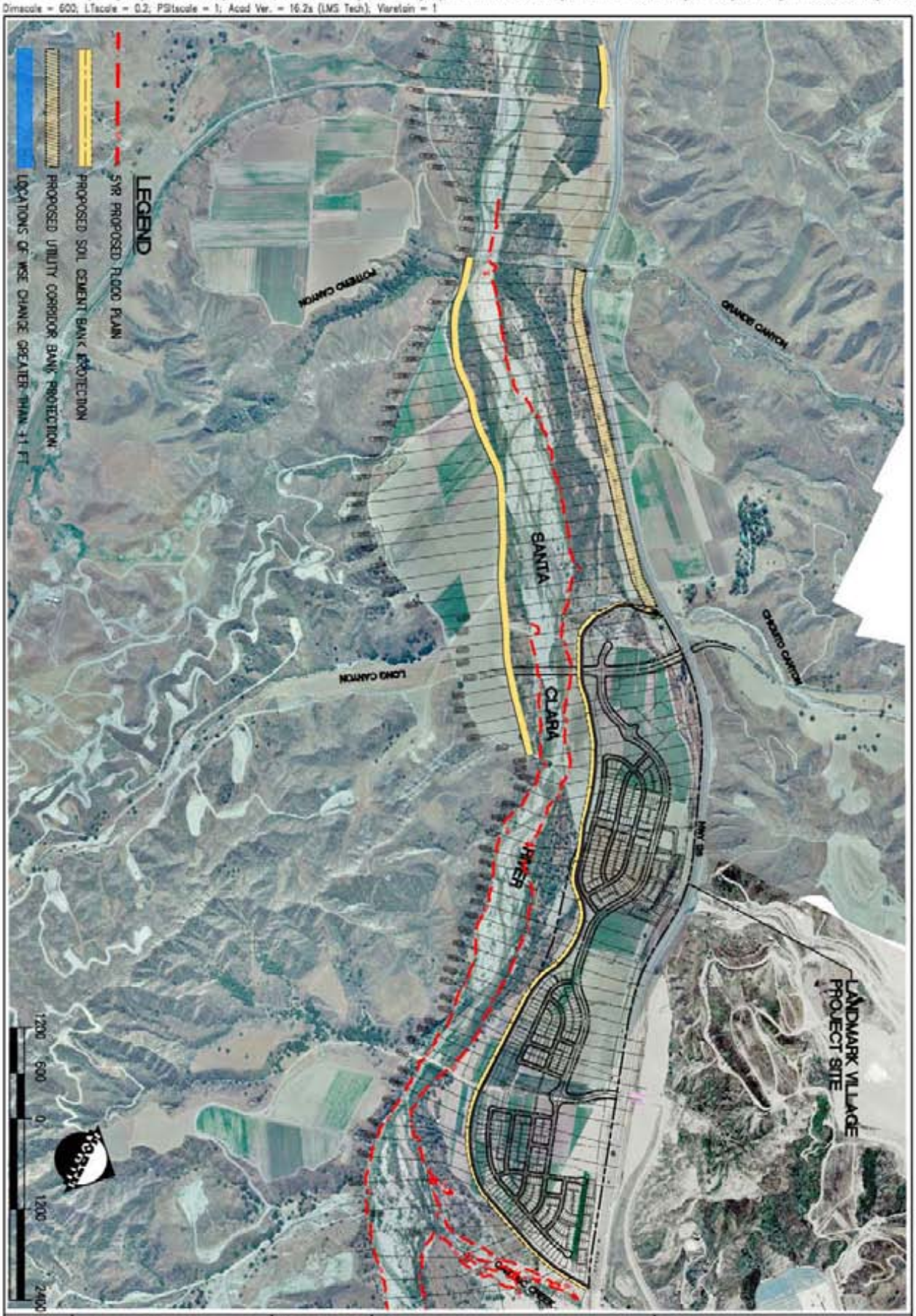


FIGURE 4.4B

PACE
PACIFIC ADVANCED CIVIL ENGINEERING

SCALE	1"= 1200'
DESIGNED	DJ
DRAWN	JEP
CHECKED	MCK
DATE	04-26-05
JOB NO.	7841-E

JOB
LANDMARK VILLAGE
SANTA CLARITA CA

TITLE
PROPOSED 5YR FLOOD PLAIN LOCATIONS WITH WSE CHANGE GREATER THAN 1 FT

P:\7841E\Engineering\GlobalExhibits\7841E-EX-PROP-COMPARISON-5YR-FIG 4.4B.dwg - Tab: 5YR PROP-FP By: ddrohn on Jun. 30, 2005 at 01:39 pm

Xrefs: 7841E-Plong_bridge.dwg; 7841-PSIRV.dwg; P-bank protection_REV.dwg; 7142-Lining.dwg; 7142-Flood Resource.dwg; 7142-river-sections1.dwg; NR-cdfg_2004.dwg; NR-acoe_2004.dwg; NR-Sec23.
Dimscale = 600; LTscale = 0.2; PSltscale = 1; Acad Ver. = 16.2s (LMS Tech); Varelsin = 1

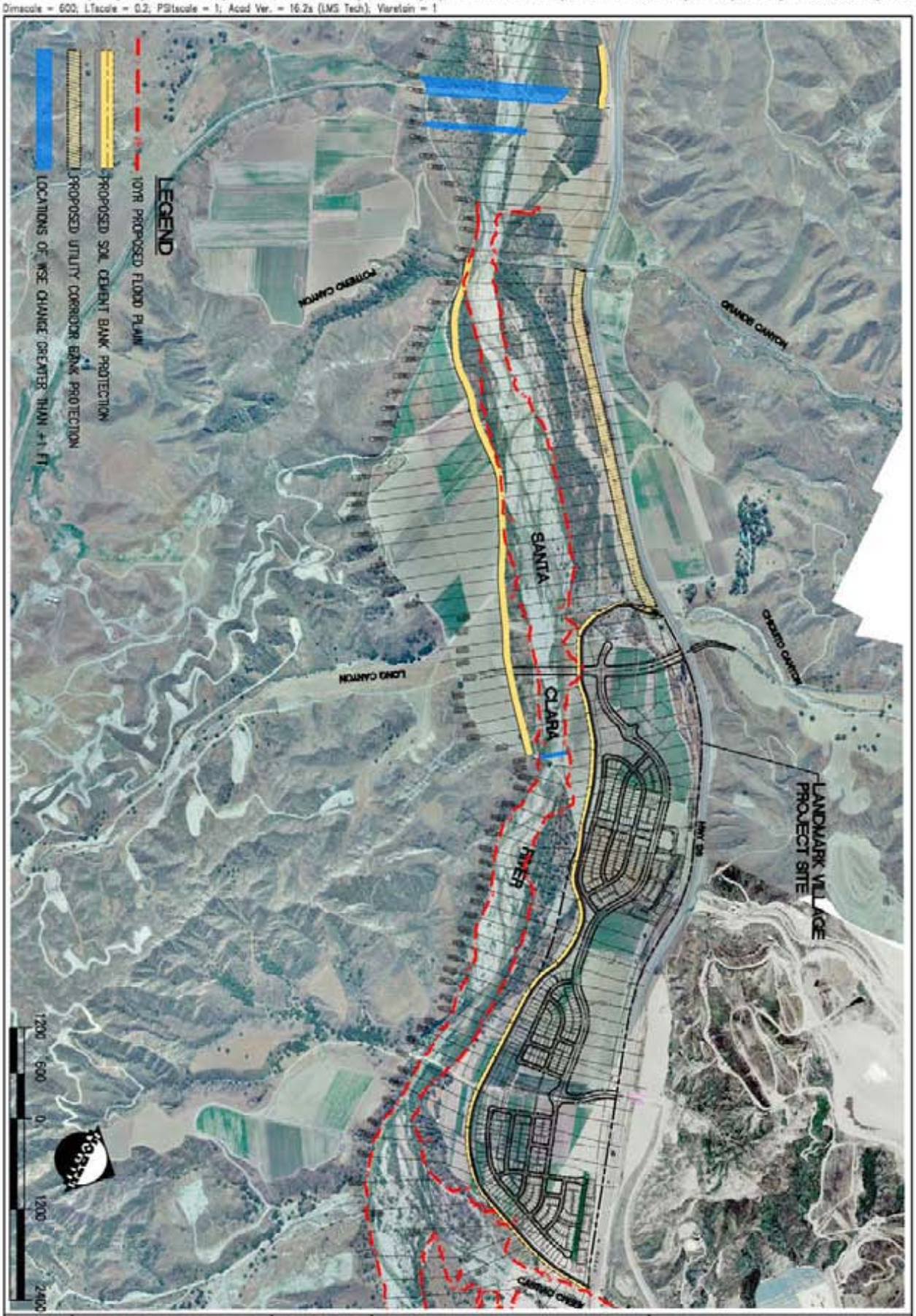


FIGURE 4.4C

PACE
PACIFIC ADVANCED CIVIL ENGINEERING

SCALE	1" = 1200'
DESIGNED	DJ
DRAWN	JFP
CHECKED	MCK
DATE	04-26-05
JOB NO.	7841-E

JOB: LANDMARK VILLAGE
SANTA CLARITA CA

TITLE: PROPOSED 10YR FLOOD PLAIN LOCATIONS WITH WSE CHANGE GREATER THAN 1 FT

P:\7841E\Engineering\GlobalExhibits\7841E-EX-PROP-COMPARISON-10YR-FIG 4.4C .dwg - Tab: 10YR PROP-FP By: ddrohn on Jun. 30, 2005 at 01:43 pm

Xrefs: 7841E-Plong_bridge.dwg; 7841-PSIRV.dwg; P-bank protection_REV.dwg; 7142-Lining.dwg; 7142-Flood Resource.dwg; 7142-river-sections1.dwg; NR-cdfg_2004.dwg; NR-acoe_2004.dwg; NR-Sec23.
Dimscale = 600; LTscale = 0.2; PSltscale = 1; Acad Ver. = 16.2s (LMS Tech); Varelsin = 1

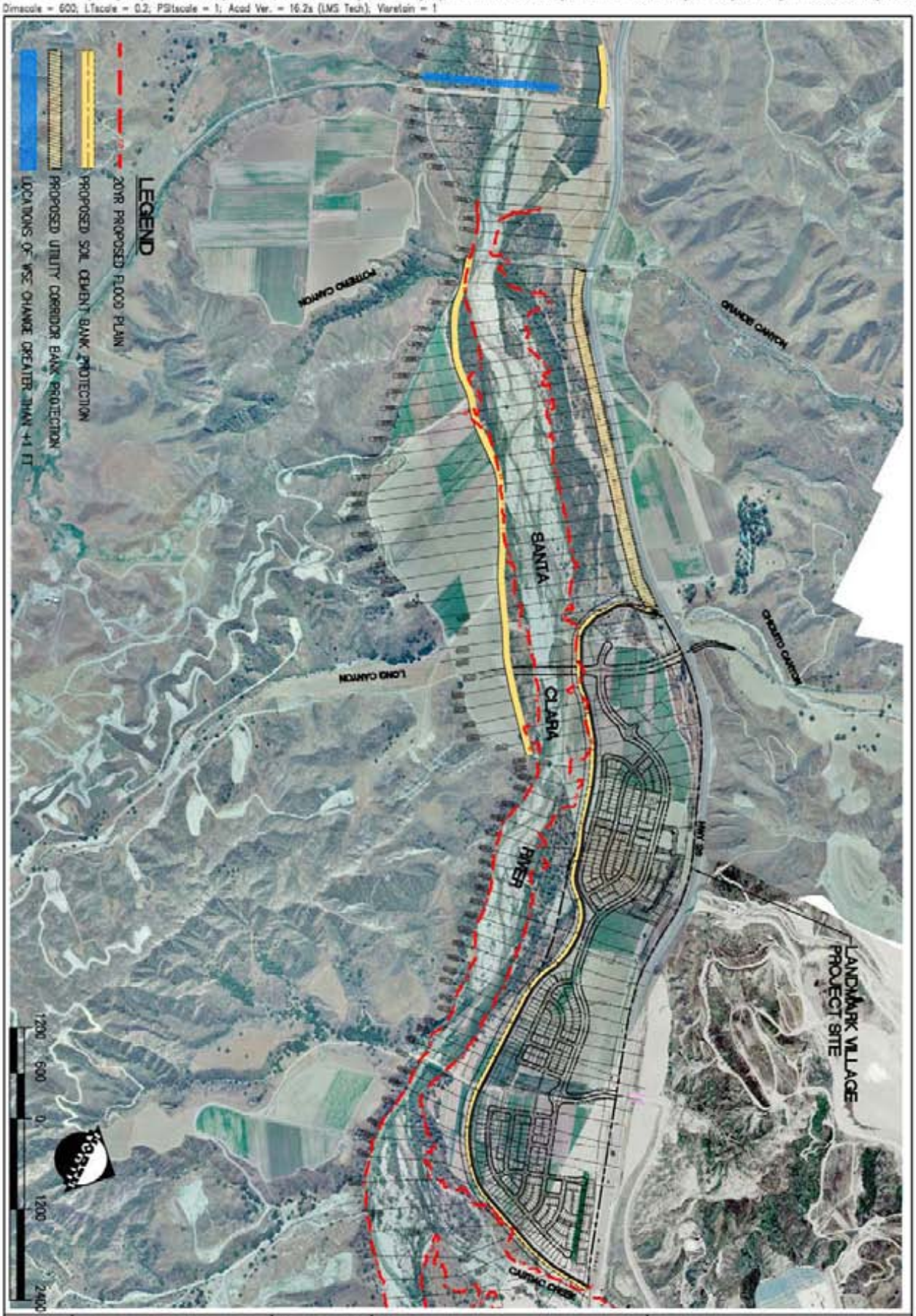


FIGURE 4.4D

PACE
PACIFIC ADVANCED CIVIL ENGINEERING

SCALE	1"= 1200'
DESIGNED	DJ
DRAWN	JFP
CHECKED	MCK
DATE	04-26-05
JOB NO.	7841-E

JOB: LANDMARK VILLAGE
SANTA CLARITA CA

TITLE: PROPOSED 20YR FLOOD PLAIN LOCATIONS WITH WSE CHANGE GREATER THAN 1 FT

P:\7841E\Engineering\GlobalExhibits\7841E-EX-PROP-COMPARISON-20YR-FIG 4.4D.dwg - Tab: 20YR PROP-FP By: ddrohn on Jun. 30, 2005 at 01:45 pm

Xrefs: 7841E-Plong_bridge.dwg; 7841-PSIRV.dwg; P-bank protection_REV.dwg; 7142-Lining.dwg; 7142-Flood Resource.dwg; 7142-river-sections1.dwg; NR-cdfg_2004.dwg; NR-acoe_2004.dwg; NR-Sec23
Dimscale = 600; LTscale = 0.2; PSltscale = 1; Acad Ver. = 16.2s (LMS Tech); Varelsin = 1

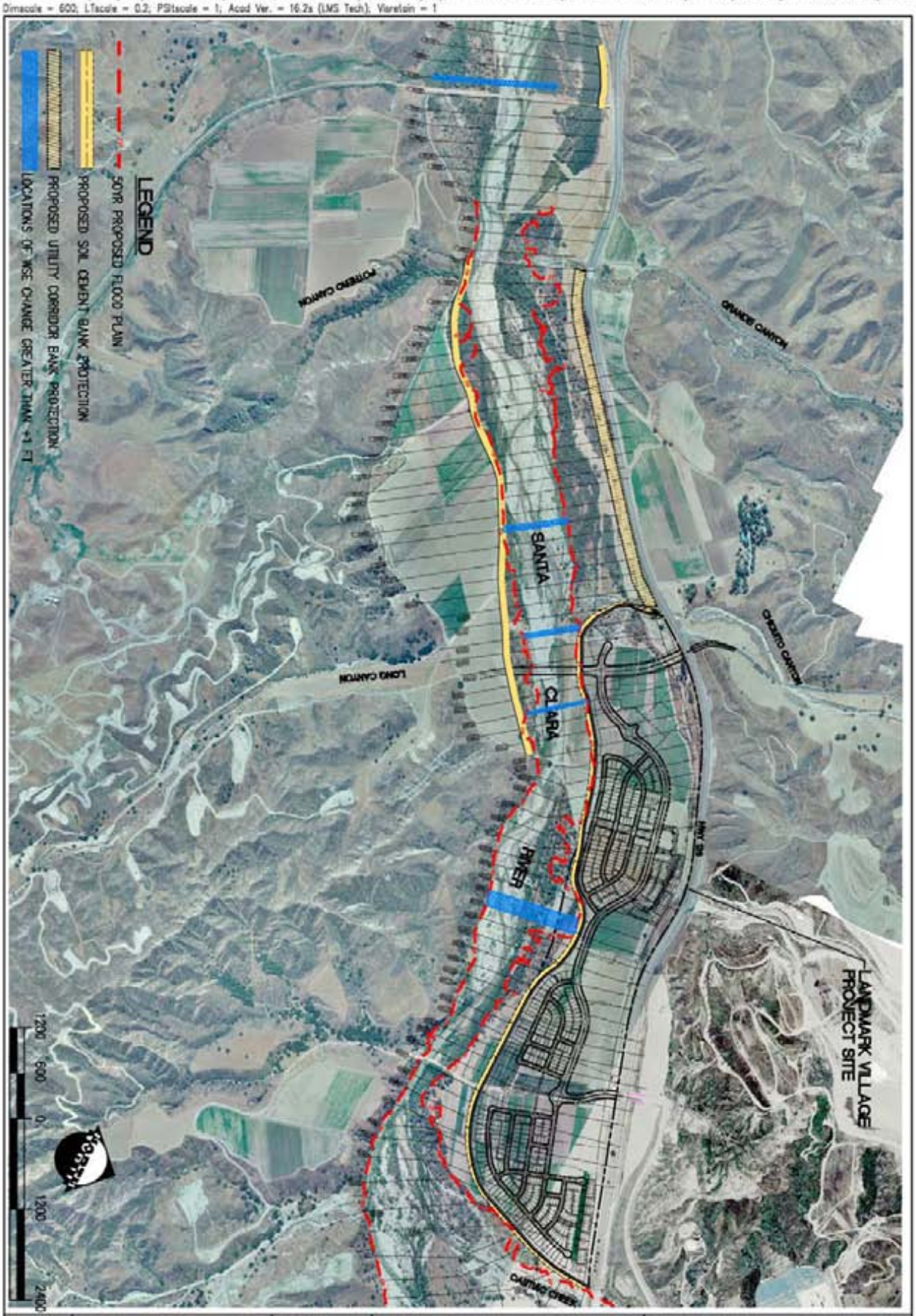


FIGURE 4.4E	PACE PACIFIC ADVANCED CIVIL ENGINEERING	SCALE 1"= 1200' / DESIGNED DJ / DRAWN JFP / CHECKED MCK / DATE 04-26-05 / JOB NO. 7841-E	JOB LANDMARK VILLAGE SANTA CLARITA CA
			TITLE PROPOSED 50YR FLOOD PLAIN LOCATIONS WITH WSE CHANGE GREATER THAN 1 FT

P:\7841E\Engineering\GlobalExhibits\7841E-EX-PROP-COMPARISON-50YR-FIG 4.4E.dwg - Tab: 50YR PROP-FP By: ddrohn on Jun. 30, 2005 at 01:48 pm

Xrefs: 7841E-Plong_bridge.dwg; 7841-PSIRV.dwg; P-bank protection_REV.dwg; 7142-Lining.dwg; 7142-Flood Resource.dwg; 7142-river-sections1.dwg; NR-cdfg_2004.dwg; NR-acoe_2004.dwg; NR-Sec23.
Dimscale = 600; LTscale = 0.2; PSltscale = 1; Acad Ver. = 16.2s (LMS Tech); Varelsin = 1

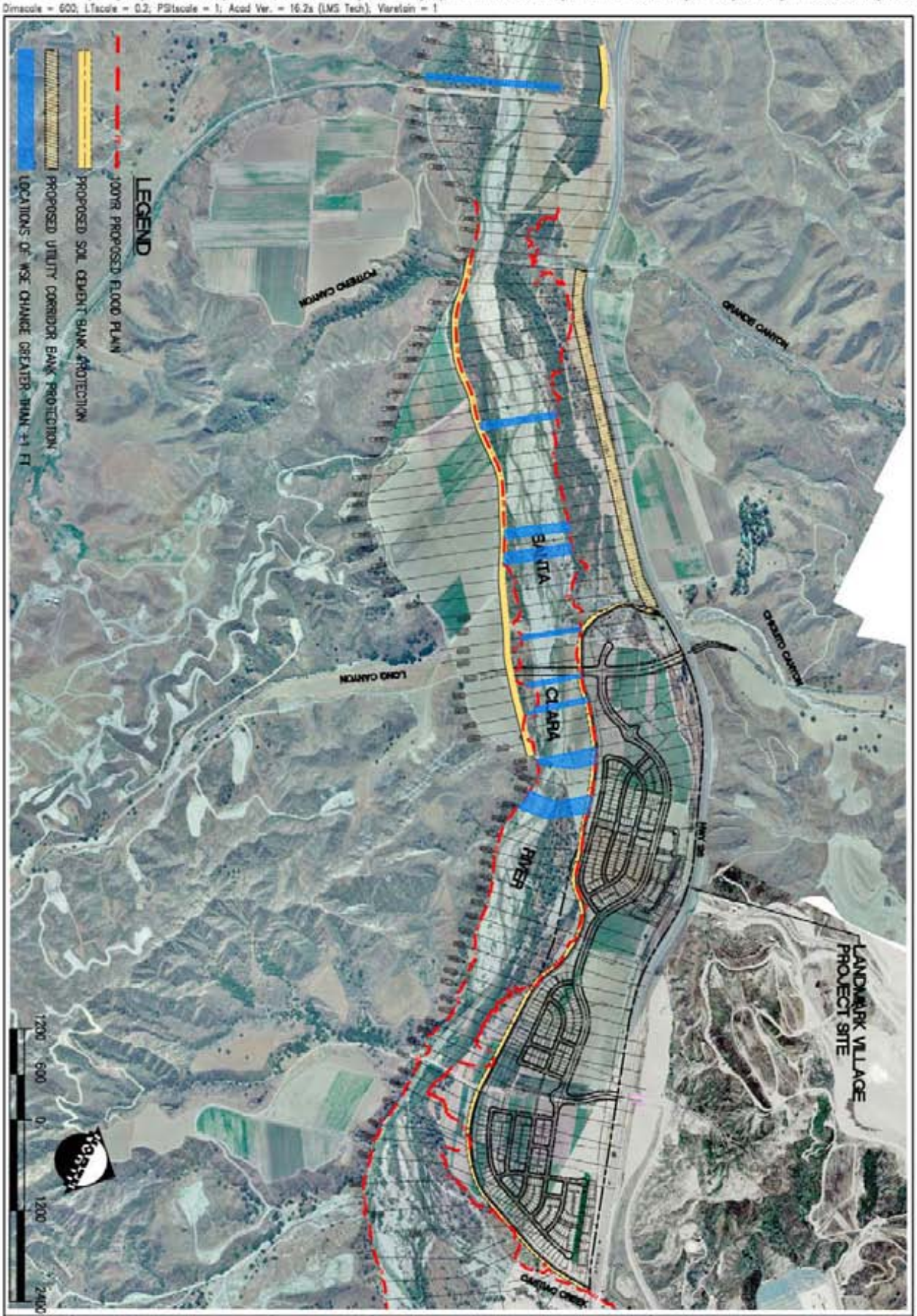


FIGURE 4.4F

PACE
PACIFIC ADVANCED CIVIL ENGINEERING
17201 NEWHOPE STREET, SUITE 200
FOUNTAIN VALLEY, CA 92708
PH (714) 481-7300 FAX (714) 481-7305

SCALE	1"= 1200'
DESIGNED	DJ
DRAWN	JFP
CHECKED	MDK
DATE	04-26-05
JOB NO.	7841-E

JOB
LANDMARK VILLAGE
SANTA CLARITA CA

TITLE
PROPOSED 100YR FLOOD PLAIN LOCATIONS WITH WSE CHANGE GREATER THAN 1 FT

P:\7841E\Engineering\GlobalExhibits\7841E-EX-PROP-COMPARISON-100YR-FIG 4.4F.dwg – Tab: 100YR PROP-FP By: ddrohn on Jun. 30, 2005 at 01:51 pm

Specific Plan. Finally, flooding up to and including the 100-year flood event and the Q_{CAP} event, would be contained within the north and south bridge abutments. As a result, no flood impacts are anticipated due to the location of the proposed bridge.

4.3 Whether Runoff Volumes Would Exceed Existing or Planned Systems

The Project would increase the amount of runoff from the Project areas covered by roads, buildings, paved parking areas, and other relatively impermeable or impervious features (refer to Table 2.1 for the assumed percent imperviousness for each land use proposed for the Project site). Specifically, impervious surfaces on the Project site would increase the amount of clear flow runoff from the site. Burned and bulked runoff and debris volumes, however, would be reduced because the developed portions of the Project site would be covered with impervious surfaces and non-erodible vegetation, and because debris basins are proposed just upstream of the Project site that would reduce the amount of debris and sediment in the runoff.

The post-development runoff quantities are provided in Table 4.6 and the discharge is predicted to total 1117 cfs for the Project site during a 50-year storm, which is a 267 cfs reduction in 50-year flows when compared to pre-development conditions. This reduction in the discharge is largely due to Project debris basins that would capture upstream bulk flows and allow debris to settle out from the runoff before it enters the storm system through the developed portion of the site.

The LACDPW defined criteria for design of flood control systems establish the more severe hydrologic conditions (e.g., burned and bulked) as the basis of impact evaluation (refer to Sections 2.1.1 and 2.1.2 of this report). The 50-year total runoff from the Project site essentially would be the same under existing and proposed Project conditions because, despite the increase in imperviousness, the sediment basins reduce the bulking. Therefore, the Project would not result in a significant increase in on-site or downstream flooding impacts.

Table 4.6: Post-Development Site Runoff Summary

Subbasins	Area(Ac)	50-Year Storm Event[A]		
		Time of Concentration (min)	Q_{bb} (cfs)	Q/A (cfs/Ac)
RVE-1A	18	24	29	1.6
RVE-2A	39	28	56	1.4
RVE-3B	15	8	46	3.1
RVE-4B	44	19	81	1.8
RVE-6A	35	11	89	2.5
			Q_{DESIGN} (cfs)	
RVE-7A	14	29	21	1.5
RVE-8A	29	30	33	1.1
RVE-9A	13	16	22	1.7
RVE-10A	1	14	1	1.0
RVE-11B	16	14	27	1.7
RVE-12C	1	15	1	1.0
RVE-13C	17	19	25	1.5
RVE-16D	2	20	2	1.0
RVE-17D	18	15	29	1.6
RVE-20E	18	16	28	1.6
RVE-21F	1	7	1	1.0
RVE-24F	2	14	2	1.0
RVE-25F	14	16	22	1.6
RVC-2A	11	9	18	1.6
RVC-3A	12	15	20	1.7
RVC-7A	10	24	14	1.4
RVC-8A	5	14	8	1.6
RVC-11B	16	11	30	1.9
RVC-12C	3	18	3	1.0
RVC-13C	1	12	1	1.0
RVC-17C	2	19	2	1.0
RVC-18C	17	14	29	1.7
RVC-21D	3	16	3	1.0
RVC-22D	2	12	5	2.5
RVC-23E	39	24	53	1.4
RVC-24E	7	22	12	1.7
			Q_{bb} (cfs)	
CQT-1/4A	23.9	7	72	3.0
CQT-5A	4.4	5	15	3.4
CQT-6A	22.6	11	61	2.7
CQT-7/8A	6.2	5	19	3.1
CQT-9A	31.8	14	51	1.6
CQT-10A	14.5	8	42	2.9
CQT-11A	7.4	21	12	1.6
CQT-12A	4.4	12	9	2.0
			Q_{DESIGN} (cfs)	
RVW-1A	11	14	17	1.5
RVW-2A	15	14	28	1.9
Σ	566.2			

A. Clear flow in developed areas. Burned, unbulked flow in undeveloped areas

B. This was calculated by Sikand in the Newhall Ranch Specific Plan Master Hydrology and Drainage Concept, Dated 3/25/05

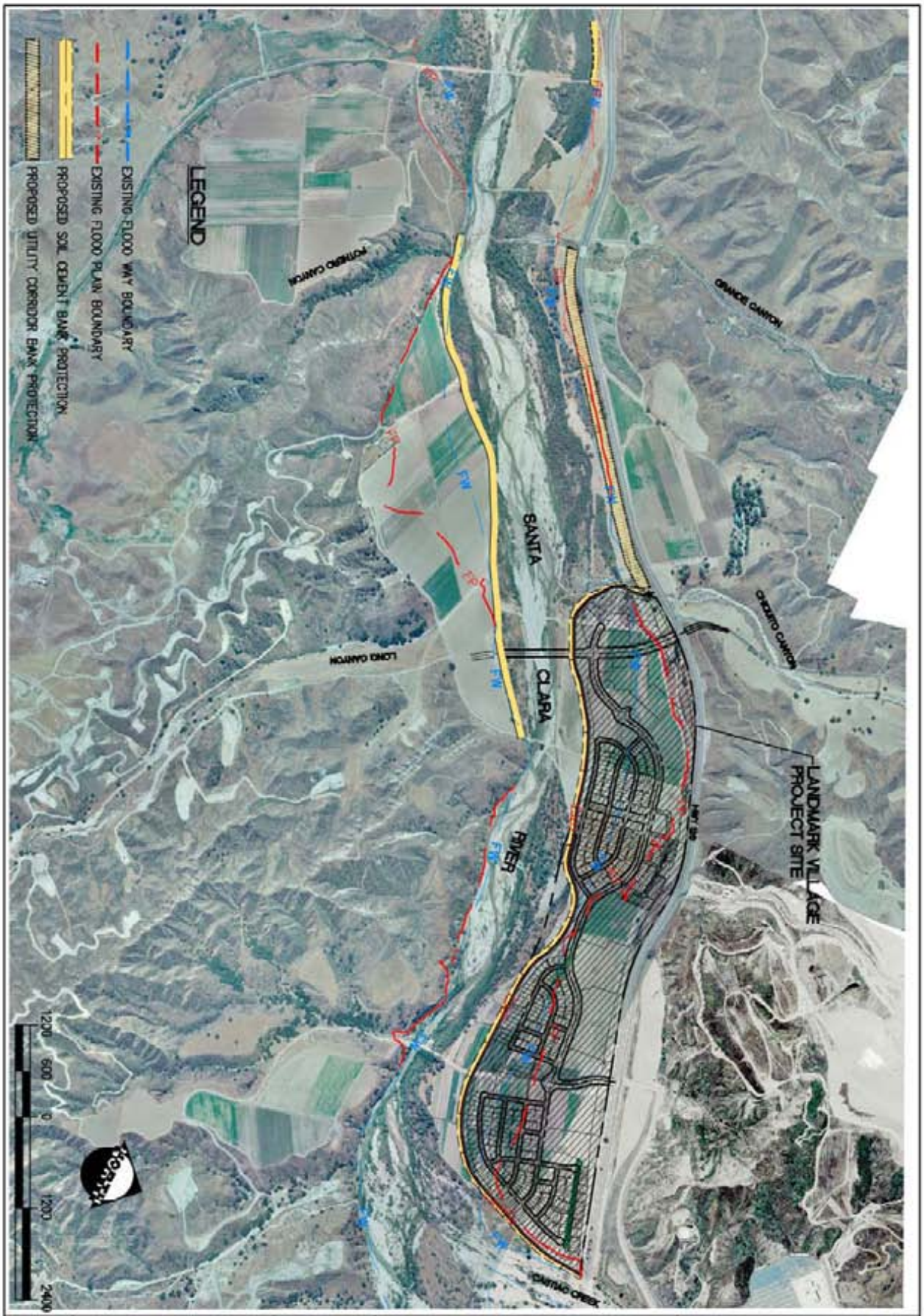


FIGURE 4.5

PACE
PACIFIC ADVANCED CIVIL ENGINEERING

SCALE	1" = 1200'
DESIGNED	DJ
DRAWN	JFP
CHECKED	MCK
DATE	04-26-05
JOB NO.	

JOB: LANDMARK VILLAGE
SANTA CLARITA CA

TITLE: COUNTY FLOOD PLAIN BOUNDARY LINES

P:\7841E\Engineering\GlobalExhibits\7841E-COUNTY FLOOD PLAIN BOUNDARIES-FIG 4.5.dwg - Tab: IMPROV MAP-1000 SCALE By: ddrahn on Jun. 30, 2005 at 01:36 pm

4.4 Exposure to Significant Risk of Loss, Injury, or Death

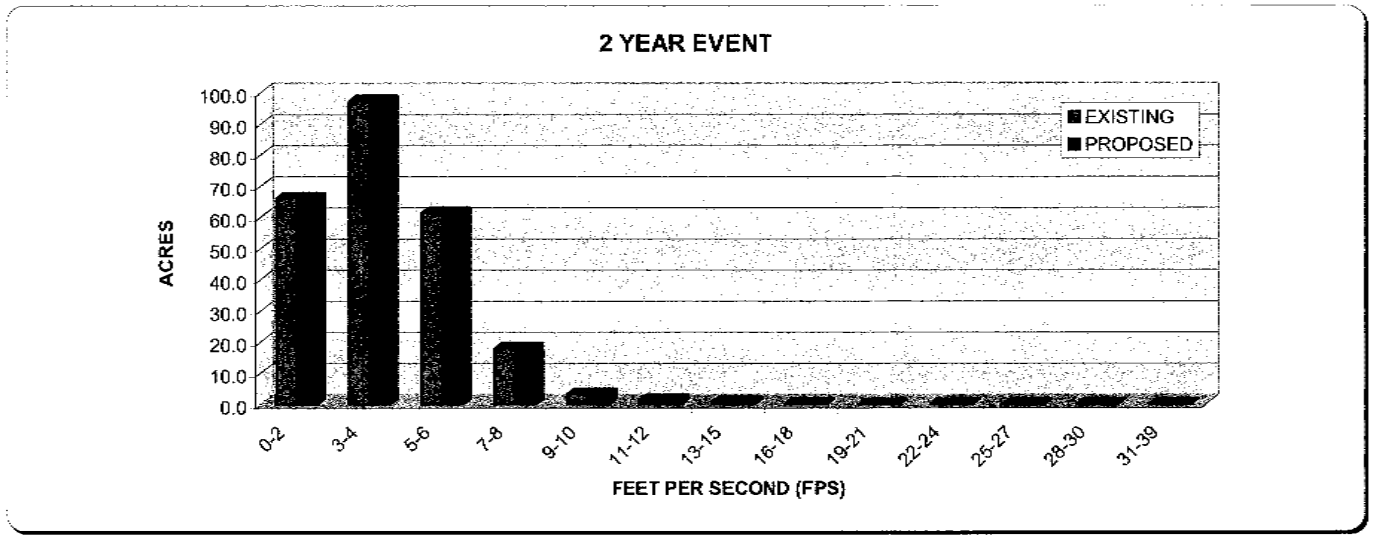
Although the site is presently subject to some debris and mud flows, adequate building setbacks from natural slopes and debris control facilities proposed in upstream areas of the Project site would protect the proposed development from debris and mudflow hazards.

As designed, the proposed soil cement and the Long Canyon Road Bridge would increase the water surface elevation of the River on-site at several locations. All changes in water surface elevation greater than one foot are presented in Table 4.7 and changes along the Project reach are illustrated in Figures 4.4A-4.4F. However, increases in water levels would dissipate, returning to a pre-project condition, prior to the end of the proposed soil cement as indicated by HEC-RAS numerical modeling, because encroachments into the floodplain only minimally impact water surface elevations at the downstream portions of the Project, below STA 18650. Therefore, increases in flood water elevations due to Project-related improvements would be limited to the applicant's property, in areas where no development is planned, or would be mitigated with the installation of flood protection. Therefore, the Project improvements would not expose people or structures to a significant risk of loss, injury or death involving flooding.

RIVER VILLAGE FLOODPLAIN AREA BY VELOCITY IMPACTS STATISTICS

2 YEAR - Floodplain Area by Velocity

Velocity (fps)	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
0-2	66.1	66.1	0.0	0.0%
3-4	97.4	97.4	0.0	0.0%
5-6	61.3	61.3	0.0	0.0%
7-8	17.9	17.9	0.0	0.0%
9-10	3.3	3.3	0.0	0.0%
11-12	1.3	1.3	0.0	0.0%
13-15	0.6	0.6	0.0	0.0%
16-18	0.0	0.0	0.0	0.0%
19-21	0.0	0.0	0.0	0.0%
22-24	0.0	0.0	0.0	0.0%
25-27	0.0	0.0	0.0	0.0%
28-30	0.0	0.0	0.0	0.0%
31-39	0.0	0.0	0.0	0.0%
	248.0	248.0	0.0	100.0%



5 YEAR - Floodplain Area by Velocity

Velocity (fps)	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
0-2	31.8	31.8	0.0	0.0%
3-4	61.7	61.7	0.0	0.0%
5-6	81.5	81.5	0.0	0.0%
7-8	59.6	59.6	0.0	0.0%
9-10	25.3	25.3	0.0	0.0%
11-12	7.1	7.1	0.0	0.0%
13-15	2.1	2.1	0.0	0.0%
16-18	0.3	0.3	0.0	0.0%
19-21	0.0	0.0	0.0	0.0%
22-24	0.0	0.0	0.0	0.0%
25-27	0.0	0.0	0.0	0.0%
28-30	0.0	0.0	0.0	0.0%
31-39	0.0	0.0	0.0	0.0%
	269.5	269.5	0.0	0.0%

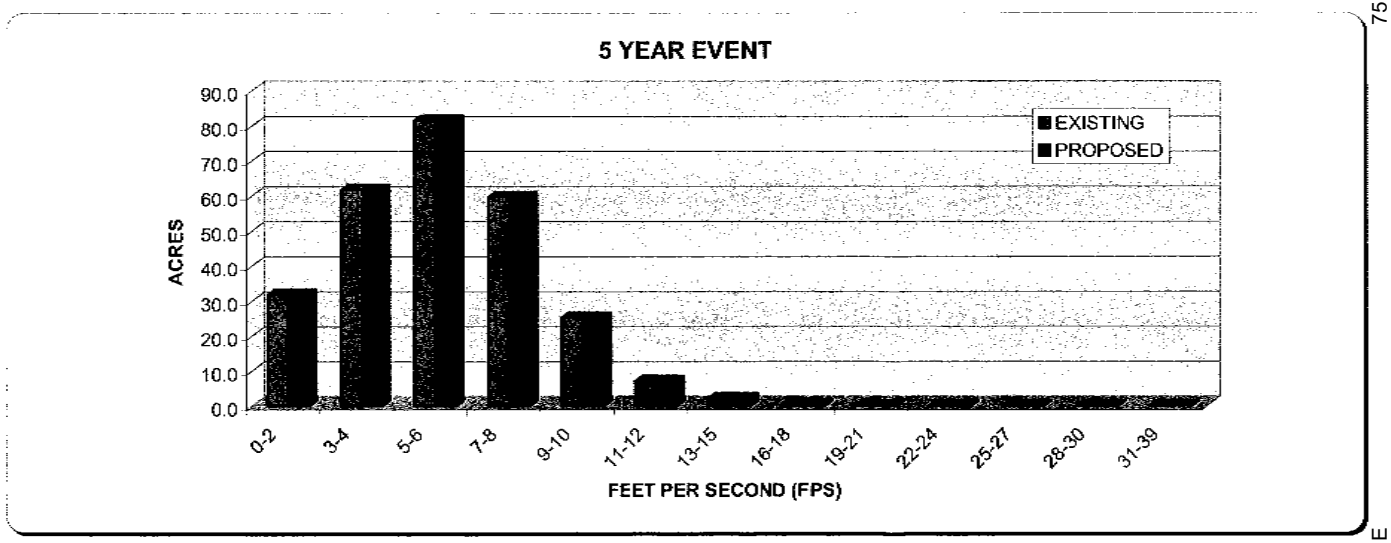
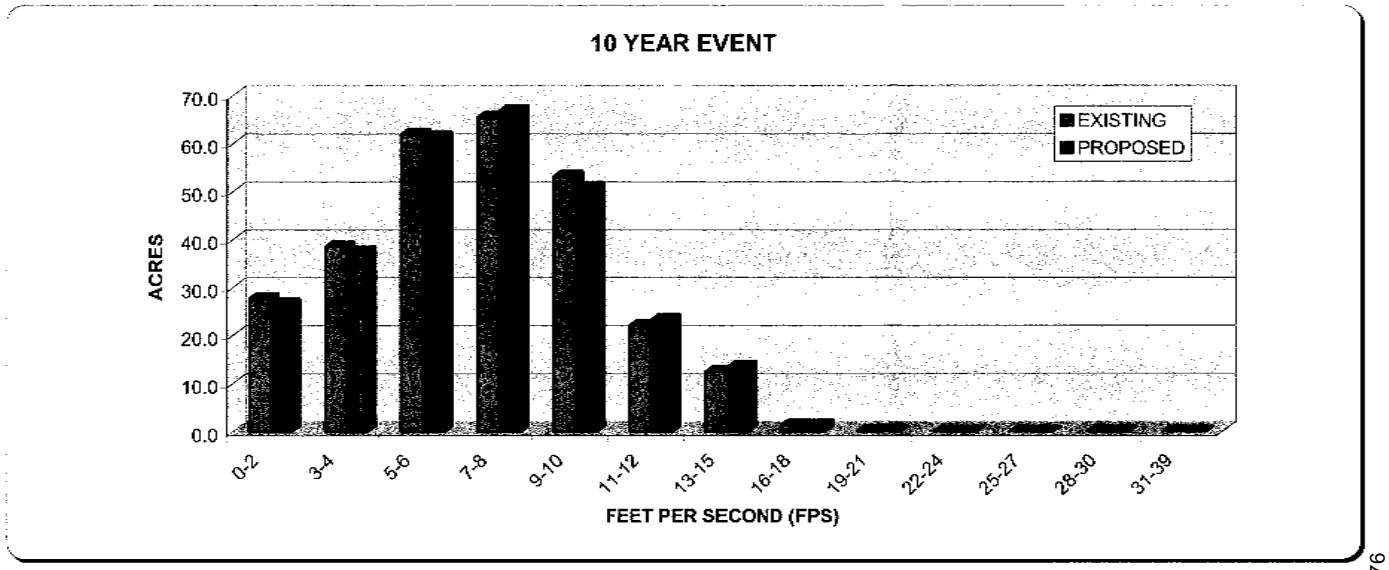


Figure 4.6a

RIVER VILLAGE FLOODPLAIN AREA BY VELOCITY IMPACTS STATISTICS

10 YEAR - Floodplain Area by Velocity

Velocity (fps)	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
0-2	27.7	26.6	-1.1	-4.0%
3-4	38.5	37.4	-1.0	-2.7%
5-6	61.9	61.3	-0.6	-1.0%
7-8	65.5	66.9	1.4	2.1%
9-10	53.2	50.8	-2.4	-4.5%
11-12	22.1	23.3	1.2	5.6%
13-15	12.5	13.5	1.1	8.7%
16-18	1.4	1.3	-0.1	-5.5%
19-21	0.2	0.2	0.0	0.8%
22-24	0.0	0.0	0.0	0.0%
25-27	0.0	0.0	0.0	0.0%
28-30	0.0	0.0	0.0	0.0%
31-39	0.0	0.0	0.0	0.0%
	282.9	281.4	-1.5	-0.5%



20 YEAR - Floodplain Area by Velocity

Velocity (fps)	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
0-2	66.1	41.2	-24.9	-37.7%
3-4	44.3	38.9	-5.4	-12.2%
5-6	48.5	45.5	-3.0	-6.2%
7-8	63.2	61.4	-1.8	-2.9%
9-10	61.6	61.9	0.3	0.5%
11-12	40.3	38.6	-1.7	-4.2%
13-15	25.8	26.7	0.9	3.4%
16-18	7.1	8.7	1.6	22.4%
19-21	1.1	1.1	0.0	-1.1%
22-24	0.3	0.3	0.0	0.4%
25-27	0.0	0.0	0.0	0.0%
28-30	0.0	0.0	0.0	0.0%
31-39	0.0	0.0	0.0	0.0%
	358.4	324.3	-34.0	-9.5%

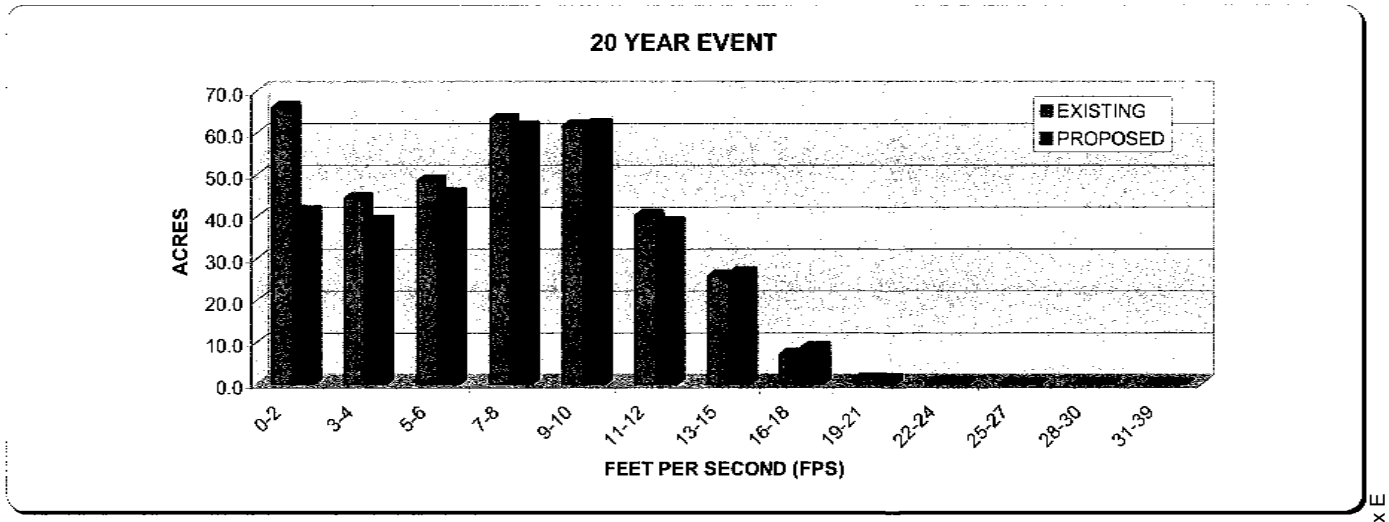
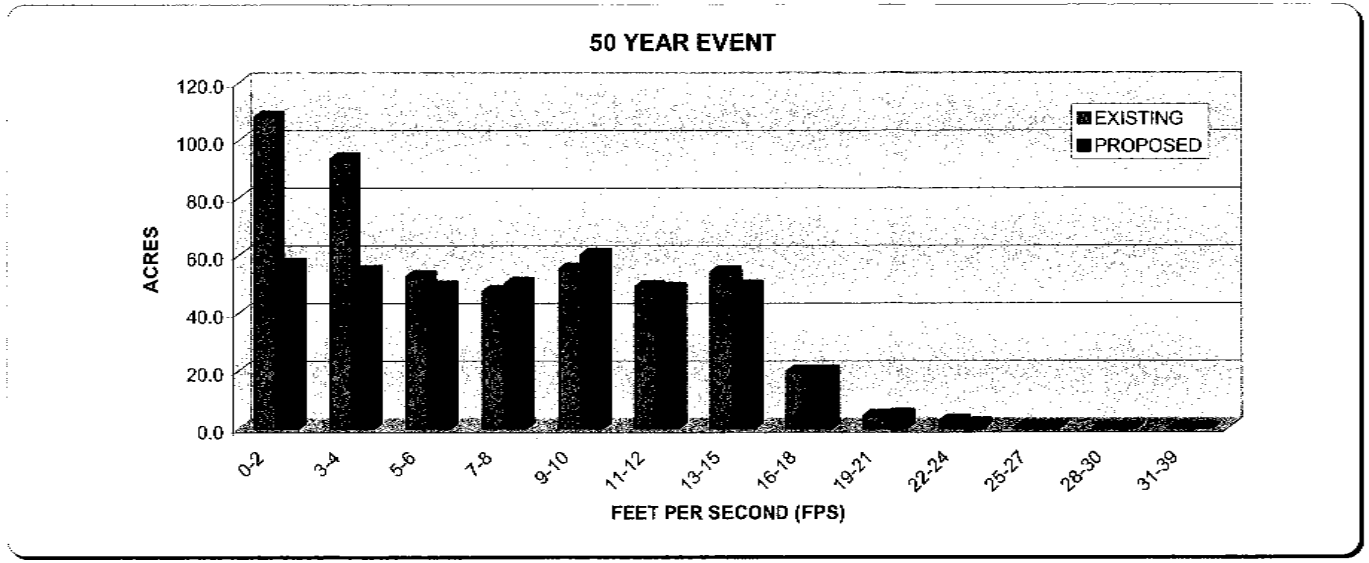


Figure 4.6b

RIVER VILLAGE FLOODPLAIN AREA BY VELOCITY IMPACTS STATISTICS

50 YEAR - Floodplain Area by Velocity

Velocity (fps)	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
0-2	108.2	56.8976	-51.3	-47.4%
3-4	93.6	54.4354	-39.1	-41.8%
5-6	52.6	49.1278	-3.5	-6.6%
7-8	47.5	50.1682	2.7	5.6%
9-10	55.3	60.3275	5.0	9.1%
11-12	49.1	48.5359	-0.6	-1.2%
13-15	54.1	49.3242	-4.8	-8.9%
16-18	19.7	19.6711	0.0	-0.1%
19-21	4.3	4.6451	0.3	8.1%
22-24	2.6	1.6629	-0.9	-36.2%
25-27	0.6	0.3390	-0.2	-41.5%
28-30	0.0	0.0	0.0	0.0%
31-39	0.0	0.0	0.0	0.0%
	487.6	395.1	-92.4	-19.0%



100 YEAR - Floodplain Area by Velocity

Velocity (fps)	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
0-2	101.1	67.6	-33.4	-33.1%
3-4	120.2	57.8	-62.5	-52.0%
5-6	86.8	58.8	-28.0	-32.3%
7-8	46.2	46.3	0.0	0.1%
9-10	38.9	41.5	2.7	6.8%
11-12	53.4	51.9	-1.5	-2.9%
13-15	62.1	65.3	3.2	5.2%
16-18	36.8	37.4	0.6	1.6%
19-21	12.3	12.1	-0.2	-1.9%
22-24	3.5	2.4	-1.2	-32.8%
25-27	2.8	1.7	-1.1	-38.5%
28-30	0.0	0.0	0.0	0.0%
31-39	0.0	0.0	0.0	0.0%
	564.1	442.7	-121.4	-21.5%

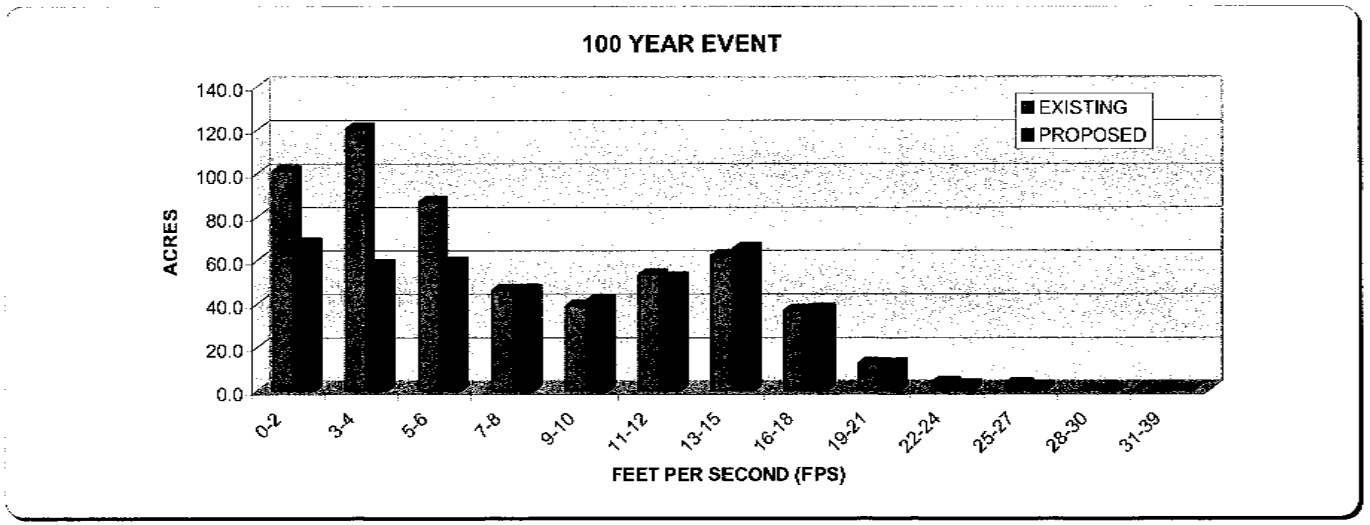


Figure 4.6c

RIVER VILLAGE FLOODPLAIN AREA BY VELOCITY IMPACTS STATISTICS

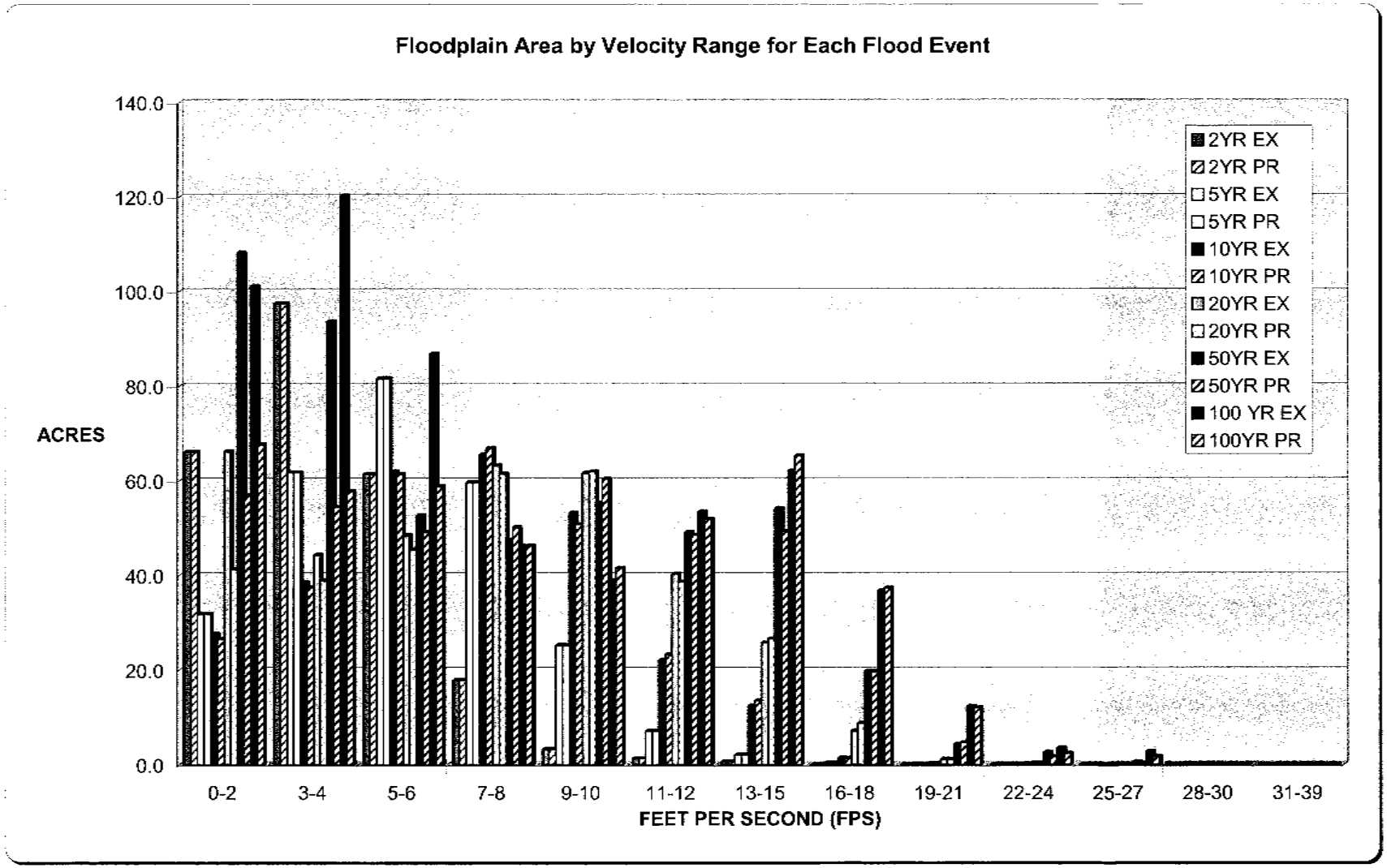


Figure 4.6d

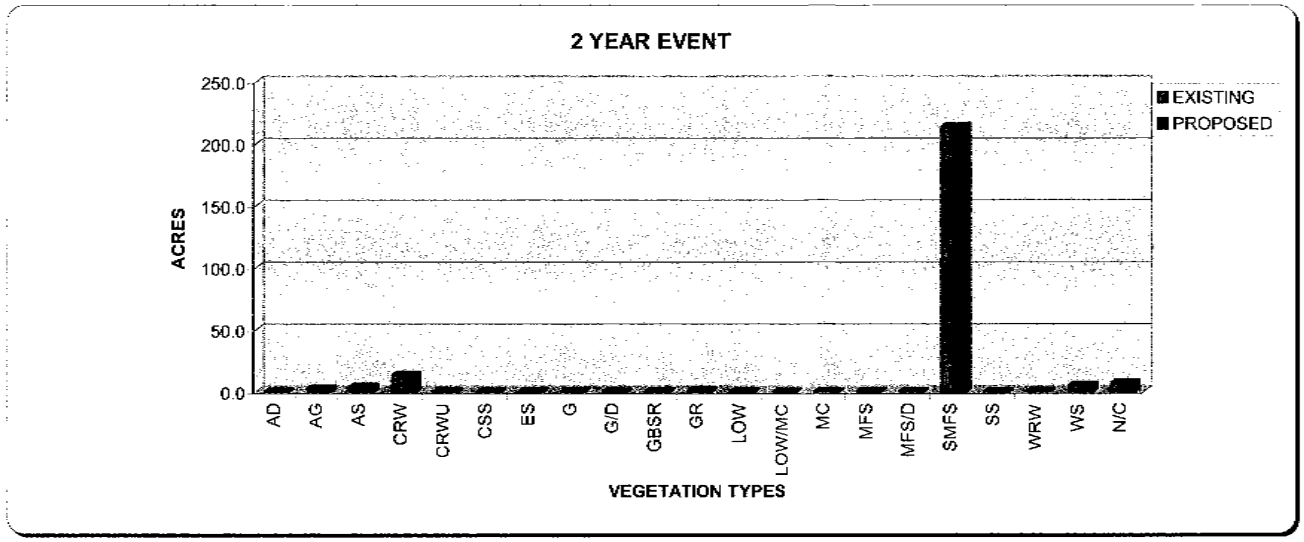
PACE

River Village Velocity-Vegetation Impacts Stats_Rev 3-23-05

FLOODPLAIN OVERALL VEGETATION COMPARISIONS

2 YEAR - Floodplain Overall Vegetation

Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	0.0	0.0	0.0	0.0%
AG	2.6	2.6	0.0	0.0%
AS	4.0	4.0	0.0	0.0%
CRW	13.2	13.2	0.0	0.0%
CRWU	0.0	0.0	0.0	0.0%
CSS	0.0	0.0	0.0	0.0%
ES	0.0	0.0	0.0	0.0%
G	0.0	0.0	0.0	0.0%
G/D	0.0	0.0	0.0	0.0%
GBSR	0.3	0.3	0.0	0.0%
GR	1.3	1.3	0.0	0.0%
LOW	0.0	0.0	0.0	0.0%
LOW/MC	0.0	0.0	0.0	0.0%
MC	0.0	0.0	0.0	0.0%
MFS	0.3	0.3	0.0	0.0%
MFS/D	0.0	0.0	0.0	0.0%
SMFS	214.0	214.0	0.0	0.0%
SS	0.0	0.0	0.0	0.0%
WRW	0.3	0.3	0.0	0.0%
WS	5.1	5.1	0.0	0.0%
N/C	6.9	6.9	0.0	0.0%
TOTAL	248.0	248.0	0.0	0.0%



5 YEAR - Floodplain Overall Vegetation

Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	3.1	3.1	0.0	0.0%
AG	5.1	5.1	0.0	0.0%
AS	14.2	14.2	0.0	0.0%
CRW	0.0	0.0	0.0	0.0%
CRWU	0.0	0.0	0.0	0.0%
CSS	0.0	0.0	0.0	0.0%
ES	0.0	0.0	0.0	0.0%
G	0.5	0.5	0.0	0.0%
G/D	0.0	0.0	0.0	0.0%
GBSR	3.3	3.3	0.0	0.0%
GR	0.0	0.0	0.0	0.0%
LOW	0.0	0.0	0.0	0.0%
LOW/MC	0.0	0.0	0.0	0.0%
MC	0.0	0.0	0.0	0.0%
MFS	0.7	0.7	0.0	0.0%
MFS/D	0.0	0.0	0.0	0.0%
SMFS	224.8	224.8	0.0	0.0%
SS	0.0	0.0	0.0	0.0%
WRW	0.9	0.9	0.0	0.0%
WS	7.4	7.4	0.0	0.0%
N/C	9.4	9.4	0.0	0.0%
TOTAL	269.5	269.5	0.0	0.0%

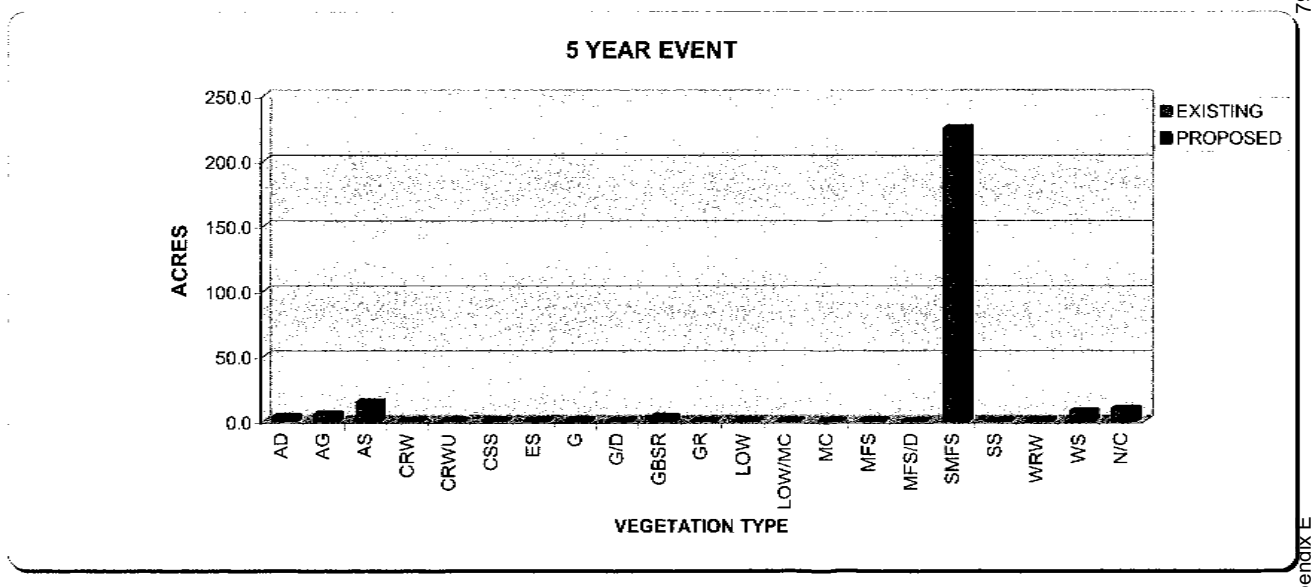
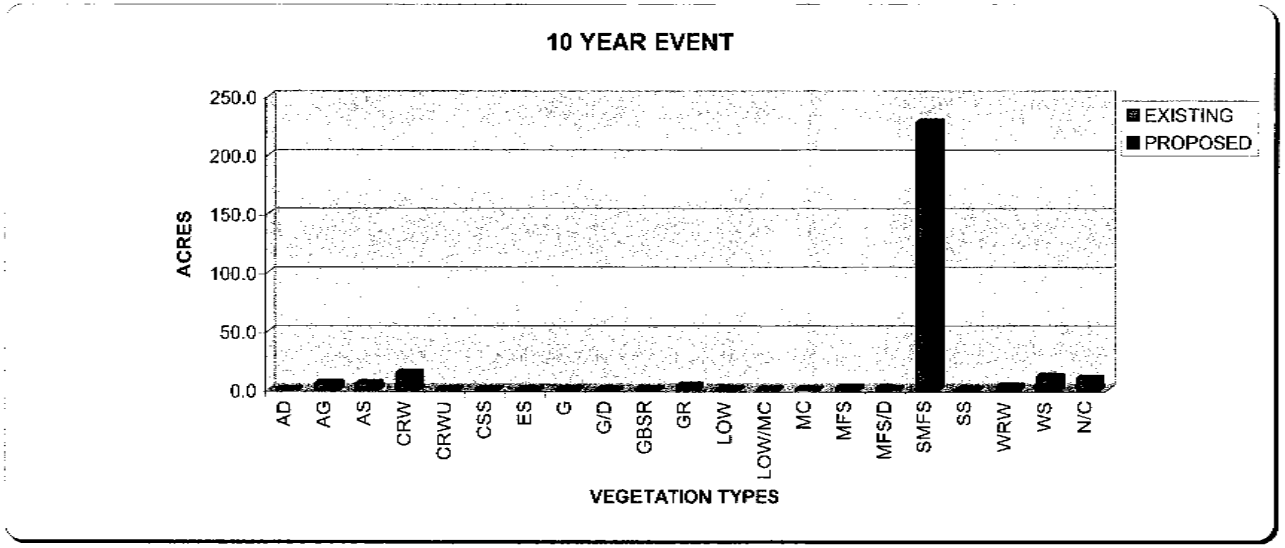


Figure 4.7a

FLOODPLAIN OVERALL VEGETATION COMPARISIONS

10 YEAR - Floodplain Overall Vegetation

Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	0.1	0.1	0.0	-1.4%
AG	5.6	5.5	-0.1	-2.3%
AS	5.1	5.1	0.0	0.0%
CRW	14.0	14.0	0.0	0.0%
CRWU	0.0	0.0	0.0	0.0%
CSS	0.0	0.0	0.0	-1.5%
ES	0.0	0.0	0.0	0.0%
G	0.1	0.1	0.0	-0.3%
G/D	0.0	0.0	0.0	0.0%
GBSR	0.5	0.5	0.0	0.0%
GR	3.3	3.3	0.0	0.0%
LOW	0.1	0.1	0.0	0.3%
LOW/MC	0.0	0.0	0.0	2.3%
MC	0.0	0.0	0.0	2.4%
MFS	1.7	1.3	-0.4	-23.4%
MFS/D	1.6	0.7	-0.9	-55.7%
SMFS	227.8	227.8	0.0	0.0%
SS	0.0	0.0	0.0	-6.4%
WRW	2.6	2.6	0.0	-0.3%
WS	10.9	10.8	-0.1	-0.8%
N/C	9.4	9.4	0.0	0.0%
TOTAL	282.9	281.4	-1.5	-0.5%



20 YEAR - Floodplain Overall Vegetation

Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	0.1	0.1	0.0	-0.2%
AG	44.4	13.6	-30.8	-69.3%
AS	5.7	5.7	0.0	-0.1%
CRW	20.4	20.1	-0.3	-1.3%
CRWU	0.0	0.0	0.0	0.0%
CSS	0.1	0.0	-0.1	-79.5%
ES	0.1	0.0	-0.1	-100.0%
G	0.1	0.1	0.0	1.4%
G/D		0.0	0.0	0.0%
GBSR	0.5	0.5	0.0	0.0%
GR	4.1	4.1	0.0	-0.1%
LOW	0.1	0.1	0.0	0.3%
LOW/MC	0.0	0.0	0.0	11.9%
MC	0.0	0.0	0.0	16.0%
MFS	3.6	3.0	-0.7	-18.4%
MFS/D	2.8	1.0	-1.9	-65.8%
SMFS	240.2	240.2	0.0	0.0%
SS	0.0	0.0	0.0	3.4%
WRW	7.0	6.7	-0.3	-4.3%
WS	19.1	19.1	0.0	0.0%
N/C	9.9	9.9	0.0	0.0%
TOTAL	358.3	324.3	-34.0	-9.5%

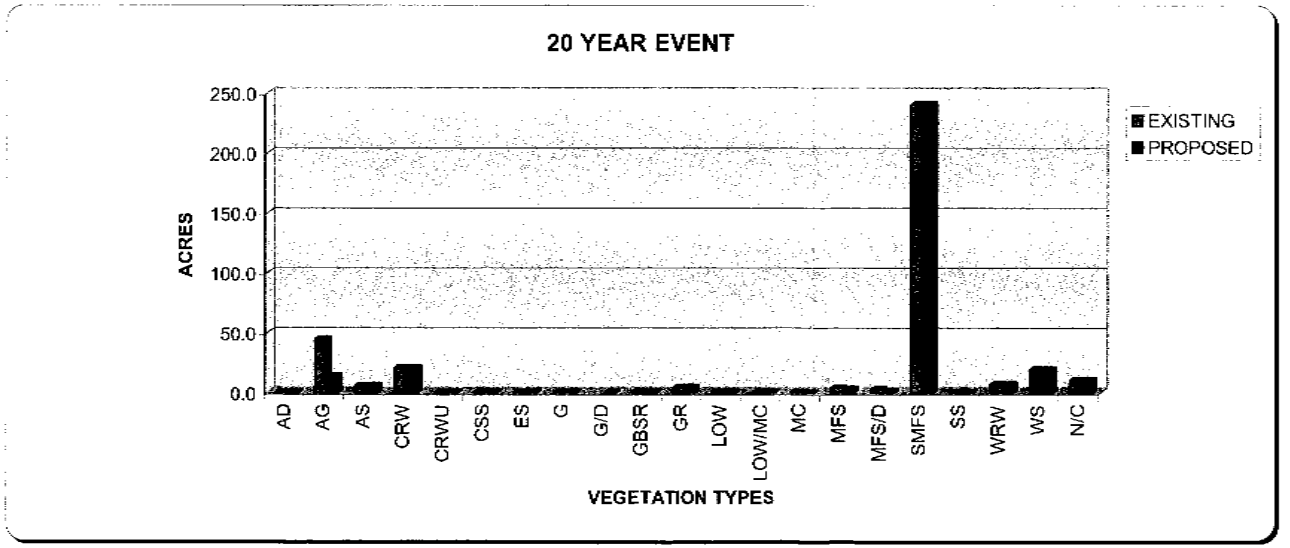
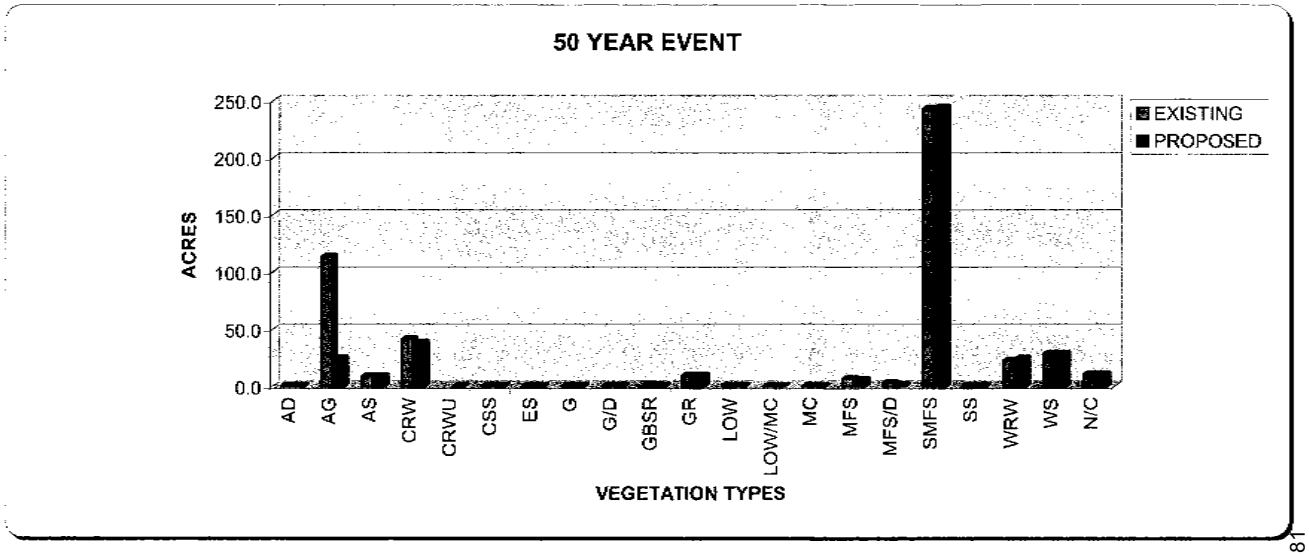


Figure 4.7b

FLOODPLAIN OVERALL VEGETATION COMPARISIONS

50 YEAR - Floodplain Overall Vegetation

Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	0.5	0.3	-0.2	-41.9%
AG	113.3	24.5	-88.8	-78.4%
AS	8.6	8.6	0.0	-0.1%
CRW	41.4	38.0	-3.4	-8.2%
CRWU		0.0	0.0	0.0%
CSS	0.3	0.2	-0.2	-52.8%
ES	0.1	0.0	-0.1	-100.0%
G	0.2	0.2	0.0	-0.2%
G/D	0.0	0.0	0.0	-100.0%
GBSR	0.5	0.5	0.0	0.0%
GR	9.3	9.3	0.0	-0.1%
LOW	0.1	0.1	0.0	-0.2%
LOW/MC	0.0	0.0	0.0	-10.3%
MC	0.0	0.0	0.0	-3.0%
MFS	6.4	5.5	-0.9	-14.7%
MFS/D	2.9	1.1	-1.9	-63.4%
SMFS	242.9	244.0	1.1	0.4%
SS	0.0	0.0	0.0	-4.4%
WRW	22.2	24.2	1.9	8.6%
WS	28.3	28.4	0.1	0.2%
N/C	10.4	10.4	0.0	0.2%
TOTAL	487.6	395.1	-92.4	-19.0%



100 YEAR - Floodplain Overall Vegetation

Vegetation Type	Existing Area (AC)	Proposed Area (AC)	Delta (AC)	Delta %
AD	0.6	0.3	-0.3	-49.9%
AG	147.2	34.1	-113.1	-76.9%
AS	8.9	8.9	0.0	0.0%
CRW	55.4	55.1	-0.3	-0.6%
CRWU	0.0	0.0	0.0	1.6%
CSS	0.5	0.3	-0.2	-40.6%
ES	0.2	0.0	0.0	0.0%
G	0.2	0.2	0.0	-3.0%
G/D	0.0	0.0	0.0	-100.0%
GBSR	0.5	0.5	0.0	0.0%
GR	9.5	9.5	0.0	0.0%
LOW	0.2	0.2	0.0	-3.5%
LOW/MC	0.0	0.0	0.0	0.0%
MC	0.1	0.1	0.0	-0.9%
MFS	9.7	7.9	-1.8	-18.8%
MFS/D	2.9	1.1	-1.8	-62.8%
SMFS	244.3	244.3	0.0	0.0%
SS	0.0	0.0	0.0	-3.3%
WRW	39.0	36.1	-2.9	-7.4%
WS	32.7	32.0	-0.6	-1.9%
N/C	12.1	12.1	-0.1	-0.5%
TOTAL	564.1	442.7	-121.4	-21.5%

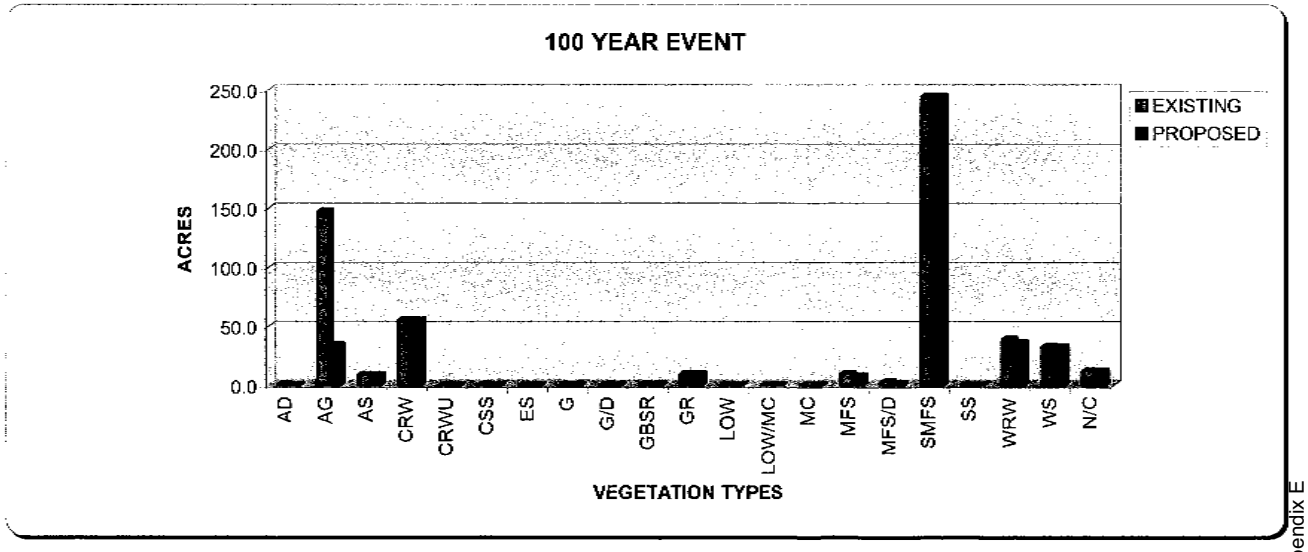


Figure 4.7c

FLOODPLAIN OVERALL VEGETATION COMPARISIONS

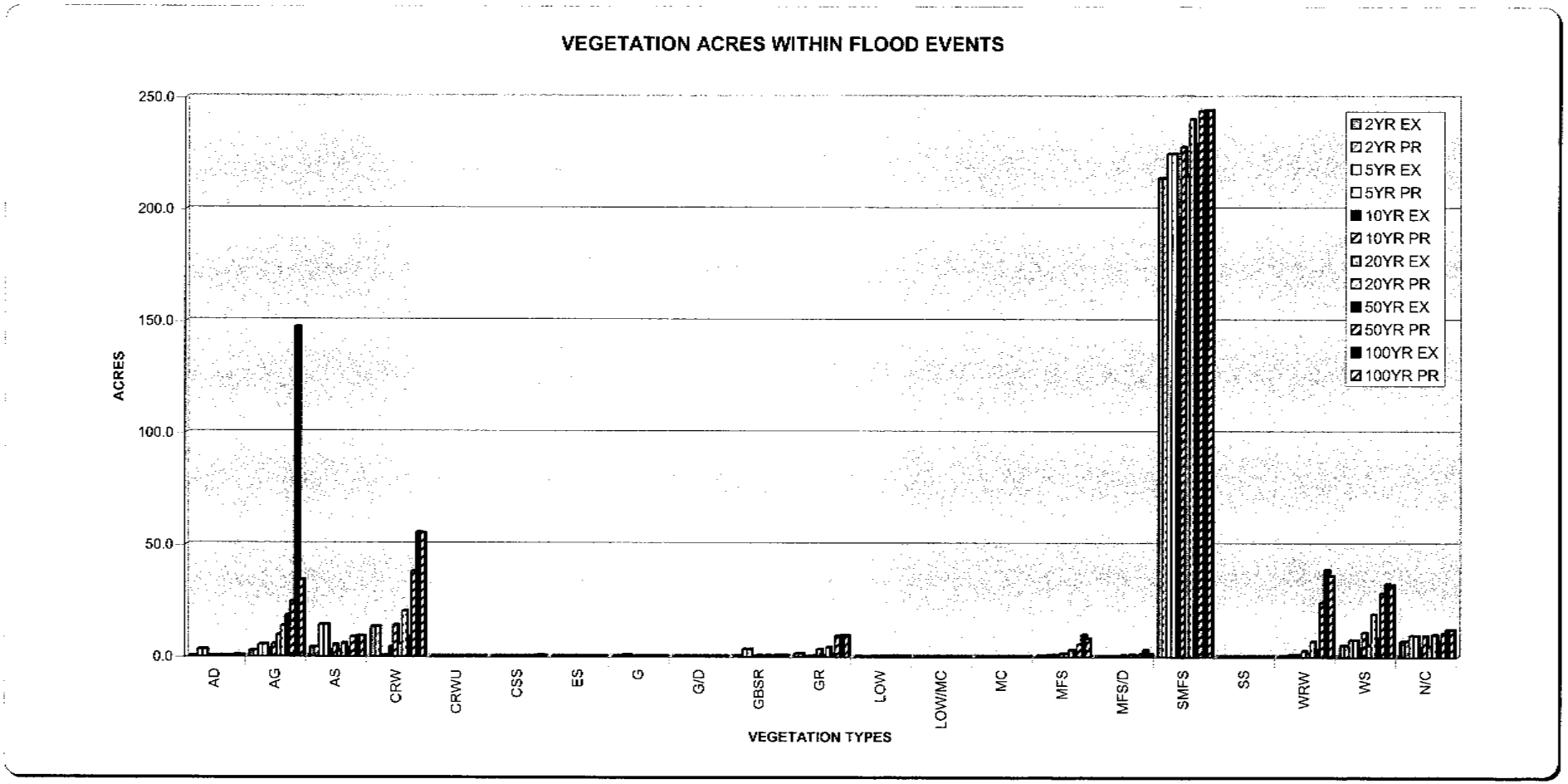


Figure 4.8

TABLE 4.7: WATER SURFACE ELEVATION CHANGES GREATER THAN 1 FT PROPOSED VS EXISTING CONDITION BY RETURN PERIOD AND STATION

T_{RETURN}	STATION	$WSE_{PROPOSED}$	$WSE_{EXISTING}$	DELTA
10	23975	910.1	909.2	**1.0**
	15745	863.9	862.3	**1.6**
	15335	860.0	861.4	**-1.5**
	15125	857.4	858.4	**-1.1**
20	15125	858.2	859.3	**-1.1**
50	26170	922.2	923.2	**-1.0**
	25965	921.8	922.8	**-1.0**
	23365	907.3	908.3	**-1.0**
	22415	903.8	902.1	**1.7**
	21020	891.5	894.8	**-3.3**
	15125	859.7	861.1	**-1.3**
100	24795	917.0	918.3	**-1.3**
	24550	914.7	916.6	**-2.0**
	24115	913.2	914.5	**-1.3**
	23975	911.9	913.2	**-1.3**
	23365	908.1	909.7	**-1.6**
	23000	907.0	908.4	**-1.4**
	22415	905.2	903.1	**2.0**
	21440	896.5	898.2	**-1.6**
	21020	892.7	896.2	**-3.5**
	19630	886.5	887.6	**-1.1**
	15125	860.8	862.4	**-1.6**
Q_{CAP}	25785	926.8	928.9	**-2.1**
	25600	924.7	927.8	**-3.1**
	25215	923.9	926.8	**-2.9**
	25000	922.1	926.4	**-4.3**
	24795	919.6	925.7	**-6.1**
	24550	920.5	922.4	**-1.9**
	24335	918.2	921.5	**-3.3**
	24115	916.4	920.9	**-4.5**
	23975	914.9	919.0	**-4.1**
	23755	914.5	916.5	**-2.0**
	23565	913.4	914.9	**-1.5**
	23365	912.9	914.6	**-1.7**
	23180	912.9	915.2	**-2.2**
	23000	912.8	915.3	**-2.4**
	22600	912.0	910.3	**1.7**
	22415	911.4	907.5	**3.9**
	22195	909.7	906.7	**3.1**
	21440	900.5	902.2	**-1.6**
	21225	898.5	901.2	**-2.6**
	21020	896.9	901.9	**-5.0**
	20845	896.2	901.7	**-5.5**
	20595	897.7	901.5	**-3.8**
	20435	897.5	900.8	**-3.3**
	20280	895.7	898.1	**-2.4**
	20070	891.7	893.1	**-1.4**
	19855	892.8	891.0	**1.9**

4.5 Whether Substantial Alteration of an Existing Drainage Pattern Would Result In Substantial Erosion or Siltation and Harmful Increases in Erosion

4.5.1 Santa Clara River/Castaic Creek/Chiquito Creek

Erosion is not anticipated to be a concern on developed portions of the Project site because the site would be covered with impermeable or impervious surfaces and landscaping would minimize the potential for erosion from undeveloped areas. Potential for erosion within the River and the major tributaries impacted by the Project can be evaluated by reviewing changes to hydraulic shear stress or flow velocities, in conjunction with potentially erodible materials. In Los Angeles County, velocities are the preferred indicator for potential streambed erosion. Because the riverbed is composed of alluvial materials, the non-erodible velocities (velocities below which no erosion would occur) range from 2.5 feet per second (fine gravels under clear flow conditions) to 5.0 feet per second (alluvial silts transporting colloidal materials) (Chow, 1959). Therefore, a representative velocity of 4.0 feet per second was determined to be the appropriate indicator for potential erosion.

A potentially significant erosion impact would arise if a significant amount of the 2- to 100-year floodplain area were in the 0-4-foot per second range, but as a result of the Project (including the Long Canyon Road Bridge and downstream bank protection), the area would be subjected to velocities greater than 4 feet/second. However, Figure 4.6 indicates that there are no increases in areas of the River that would be subject to velocities over 4 feet/second during a 2- and 5-year storm event. Additionally, there would be decreases in velocity for 10-year through 100-year storm events. The changes in acreage for given velocity ranges are shown in Figures 4.6a-4.6d.

4.5.2 On-Site Drainage Discharge Points

The Los Angeles MS4 Permit notes that increased volume, velocity, and discharge duration of stormwater runoff from developed areas could potentially accelerate downstream erosion and impair stream habitat. As a result, the Permit stipulates that "Permittees shall control post-peak stormwater runoff in Natural Drainage Systems to prevent accelerated stream erosion and protect stream habitat." The following discussion supports the conclusion that there are no significant downstream impacts potentially accelerating erosion or significantly impacting stream habitat:

- In natural riverine systems such as Santa Clara River and its tributaries, frequent discharges (on the order of the average annual and 2-year flows) dictate stream geomorphology. Extended and frequent discharges at these critical flow rates would potentially impact stream health. The Project proposes to install water quality design features, which will capture runoff from small, frequent storms and release flows to the River at non-erosive rates. That is, water from the basins would be released a rate substantially less than existing discharges associated with two-year storms, therefore,

erosive impacts to the River would be reduced to a less than significant level.

- To reduce storm flow velocities during smaller, more frequent flows (i.e., 2-year storm events) and to prevent erosion at stormwater discharge points into the River, the Project incorporates energy dissipaters consisting of either rip-rap or larger standard impact type energy dissipaters at affected storm system outlets in the River. These energy dissipaters would slow the rate of flow of runoff into the River in order to prevent erosion of the stream channel.

- Energy dissipaters and water quality basins used to reduce erosion risk in smaller events will also reduce erosion risk in larger events. It should be noted, however, that erosive forces in the River associated with less frequent, large events (100-year discharge) have erosive impacts that far exceed the erosive impacts of the Project.

4.5.3 Utility Corridor Analysis

The proposed utility corridor is comprised of two parts: the westerly extension of the utility corridor (protected with TRM's) and the easterly extension of the utility corridor, a portion of which requires bank stabilization that was already approved and analyzed under the previously adopted Natural River Management Plan. This analysis supports the use of TRM's on the westerly extension of the utility corridor, rather than exposed or buried soil cement.

A hydraulic analysis of the westerly extension of the utility corridor (protected with TRM's) is described below. This analysis evaluated water velocities in the reach between the Project site and the WRP on the northern edge of the River corridor, STA 22010 to STA 17785. A uniform distance from the road and the rail right-of-way area to the southern edge of the utility corridor was established for the entire reach. The horizontal location of the corridor was determined to be 67 feet from the rail right-of-way area to the edge of the utility corridor. At this location, a vertical levee was created in HEC-RAS to represent the boundary between the River and the utility corridor. The levee affected the hydraulic geometry of 22 cross-sections in the reach from Landmark Village west to the WRP. One primary simulation was run in HEC-RAS, the Q_{CAP} flood event (140,793 cfs), under a mixed flow regime and a mixed Manning's *n* conditions based on aerial photography analysis. Under these conditions, when the water surface elevation was high enough to reach the banks, the water velocities at the levee were very low, ranging from 0.8 to 4.1 ft/s (Table 4.8). These modeled velocities would not require hardened bank protection. In this case, approximately 4,600 linear feet of TRM will be permanently placed on the bank to ensure protection from erosion.

TABLE 4.8: MODELED VELOCITY AT UTILITY CORRIDOR (FPS)	
STATION	WSE
22010	NR
21790	NR
21615	NR
21440	NR
21225	NR
21020	NR
20845	**4.1**
20595	3.3
20435	2.8
20280	3.2
20070	2.0
19855	NR
19630	0.8
19440	2.0
19240	NR
19050	NR
18830	NR
18650	NR
18475	NR
18290	NR
18025	NR
17785	NR

NR: WATER SURFACE DOES NOT REACH THE BANK

4.5.4 Impact on Floodplain and Habitat Area

The proposed improvements associated with the Specific Plan would alter the existing boundary of the River floodplain at the Project site, as shown in Figure 3.1. A summary of the changes in the floodplain area due to the development of the Project is shown in Figure 4.2.

For high frequency floods (2- and 5-year), the proposed floodplain modifications would not hinder flows or reduce the floodplain area (Figure 4.3a-4.3b). Instead, these flows would spread across the River channel, unaffected by the bank protection because the River would have sufficient width to allow these flows to meander and spread out as under pre-Project conditions. During more infrequent floods (10-, 20-, 50- and 100-year events), River flows would be confined within the River corridor now defined by the bank stabilization (Figure 4.3c-4.3f). This would limit the area of the floodplain during these infrequent flood events, resulting in inundation over a smaller area. Most of the areas being developed in conjunction with the Project consist of agricultural fields and, to a lesser extent, disturbed and upland habitat areas with limited riparian habitat. Figures 4.7A-4.7C show the different habitat types affected by proposed development at different return periods. The figure shows that a large percent of the total impact results from converting agricultural land to a developed condition. Figure 4.8 compares the vegetation acres within various flood events for both the existing and proposed conditions. The figure shows that some vegetation types are more exposed to flooding in

the Project condition, while the largest decrease is under agriculture. This data is shown numerically in Table 4.9.

Table 4.9: Acreage Inundated by Habitat Type During Different Return Events

Habitat Type	Flood Events											
	2-year		5-year		10-year		20-year		50-year		100-year	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
AD	0.0	0.0	3.1	3.1	0.1	0.1	0.1	0.1	0.5	0.3	0.6	0.3
AG	2.6	2.6	5.1	5.1	5.6	5.5	44.4	13.6	113.3	24.5	147.2	34.1
AS	4.0	4.0	14.2	14.2	5.1	5.1	5.7	5.7	8.6	8.6	8.9	8.9
CRW	13.2	13.2	0.0	0.0	14.0	14.0	20.4	20.1	41.4	38.0	55.4	55.1
CRWU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSS	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.2	0.5	0.3
ES	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2	0.0
G	0.0	0.0	0.5	0.5	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
G/D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBSR	0.3	0.3	3.3	3.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GR	1.3	1.3	0.0	0.0	3.3	3.3	4.1	4.1	9.3	9.3	9.5	9.5
LOW	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
LOW/MC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
MFS	0.3	0.3	0.7	0.7	1.7	1.3	3.6	3.0	6.4	5.5	9.7	7.9
MFS/D	0.0	0.0	0.0	0.0	1.6	0.7	2.8	1.0	2.9	1.1	2.9	1.1
SMFS	214.0	214.0	224.8	224.8	227.8	227.8	240.2	240.2	242.9	244.0	244.3	244.3
SS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WRW	0.3	0.3	0.9	0.9	2.6	2.6	7.0	6.7	22.2	24.2	39.0	36.1
WS	5.1	5.1	7.4	7.4	10.9	10.8	19.1	19.1	28.3	28.4	32.7	32.0
N/C	6.9	6.9	9.4	9.4	9.4	9.4	9.9	9.9	10.4	10.4	12.1	12.1
TOTAL	248.0	248.0	269.5	269.5	282.9	281.4	358.4	324.3	487.6	395.1	564.1	442.7

AG Agricultural and Other Develops
AD Agricultural Drain
AS Alluvial Scrub
CRW Southern Cottonwood/Willow Ri
CRWU Southern Cottonwood/Willow Up
CSS Coastal Sage Scrub
ES Elderberry Scrub
G Grassland
G/D Disturbed Grassland
GBSR Riparian Great Basin Scrub
GR Riparian Grassland
LOW Live Oak Woodland
LOW/MC Live Oak Woodland/Mixed Chaparral
MC Mixed Chaparral
MFS Mule Fat Scrub
MFS/D Disturbed Mule Fat Scrub
SMFS Successional Mule Fat Scrub
SS Scalebroom Scrub
WRW Southern Willow Riparian Woodland
WS Southern Willow Scrub
N/C Not Coded

Geosyntec, Landmark Village Flood Technical Report

DRAFT

Landmark Village
Water Quality Technical Report

Prepared for

Newhall Land
Valencia, California

Prepared by

GeoSyntec Consultants
Portland, Oregon
Oakland, California

June 2005

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Acronyms

ASCE:	American Society of Civil Engineers
BAT:	Best Available Technology
BCT:	Best Conventional Technology
BMP:	Best Management Practice
BOD:	Biochemical Oxygen Demand
CASQA:	California Stormwater Quality Association
CEQA:	California Environmental Quality Act
CTR:	California Toxics Rule
CWA:	Clean Water Act
CWP:	Center For Watershed Protection
DCIA:	Directly Connected Impervious Area
DDT:	Dichlorodiphenyltrichloroethane
DLWC:	Department of Land and Water Conservation
EIR:	Environmental Impact Report
EMC:	Event Mean Concentration
EPA:	Environmental Protection Agency
HOA:	Home Owners Association
HEC:	Herrera Environmental Consultants
IRWD:	Irvine Ranch Water District
LACDPW:	Los Angeles County Department of Public Works
LARWQCB:	Los Angeles Regional Water Control Board
MBAS:	Methylene Blue Activated Substances
MEP:	Maximum Extent Practicable
MPN:	Most Probable Number
MS4:	Municipal Separate Storm Sewer System
NCDC:	National Climatic Data Center
NHC:	Northwest Hydraulic Consultants
NPDES:	National Pollutant Discharge Elimination System
NSWQ:	National Storm Water Quality Database
PAH:	Polycyclic Aromatic Hydrocarbons
PCB:	Polychlorinated Biphenyl
PCC:	Pacific Coast Civil Inc.
PDF:	Project Design Feature
PIPP:	Public Information and Participation Program
RTFA:	R.T. Frankian & Associates
RWQCB:	Regional Water Quality Control Board
SAR:	Sodium Adsorption Ratio

SCR:	Santa Clara River
SDRWQCB:	San Diego Regional Water Quality Control Board
SQMP:	Stormwater Quality Management Plan
SUSMP:	Standard Urban Stormwater Mitigation Plan
SWPPP:	Storm Water Pollution Prevention Plan
SWRCB:	State Water Resources Control Board
TDS:	Total Dissolved Solids
TKN:	Total Kjeldahl Nitrogen
TMDL:	Total Maximum Daily Load
TN:	Total Nitrogen
TP:	Total Phosphorus
TPH:	Total Petroleum Hydrocarbons
TSS:	Total Suspended Solids
USEPA:	United States Environmental Protection Agency
USGS:	United States Geological Survey
WEF:	Water Environment Federation
WDR:	Waste Discharge Requirements
WHO:	World Health Organization
WMA:	Watershed Management Area
WMC:	Watershed Management Committee
WRP:	Water Reclamation Plant

1 INTRODUCTION

This report addresses the potential impacts of the proposed Landmark Village Project (the Project), a portion of the Newhall Ranch Specific Plan, on water quality in the Project's receiving waters, the Santa Clara River. To evaluate impacts of the Project on water quality, pollutants of concern are identified based on regulatory and other considerations. Potential changes in water quality are addressed for pollutants of concern based on runoff water quality modeling, literature information, and professional judgment. Impacts take into account Project Design Features (PDFs) selected consistent with the Los Angeles County Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit, including the Standard Urban Stormwater Mitigation Plan (SUSMP) requirements. The level of significance of impacts is evaluated using a weight of evidence approach considering significance criteria that include predicted runoff quality for proposed versus existing conditions, MS4 Permit and General Construction Permit requirements, and reference to receiving water quality benchmarks, including Total Maximum Daily Load (TMDL) waste load allocations and water quality standards from the Basin Plan and California Toxics Rule.

The report also assesses the potential for post-development peak stormwater runoff discharge rates, velocities, and durations to cause accelerated stream erosion and to impact stream habitat, and includes PDFs to address these impacts and to comply with the Interim Peak Flow Runoff Criteria for New Development, adopted by the County of Los Angeles in January, 2005, pursuant to the MS4 Permit.

The purpose of this Water Quality Technical Report is to assess the Project's potential impacts on surface water quality and hydrology in the receiving waters, to identify Project Design Features for inclusion in the Project, and to serve as the Planning Area Stormwater Mitigation Plan (SWMP). GeoSyntec Consultants has prepared a Sub-Regional Stormwater Mitigation Plan for the Newhall Ranch Specific Plan (NRSP) (GeoSyntec, 2005). This Landmark Village SWMP is an independent component of, and is consistent with, the framework for stormwater water quality and hydromodification management established by the NRSP Sub-Regional SWMP.

Potential hydrologic impacts related to stormwater volume and velocity from the 50 year storm event and the 50 year capital flood event are addressed in "Landmark Village Tentative Tract Map 53108 Drainage Concept" prepared by Psomas (Psomas, 2005) and the "Flood Technical Report" prepared by Pacific Advanced Civil Engineering, Inc. for the Landmark Village Project (PACE, 2005). Potential biological impacts of the Landmark Village Project are addressed in the "Landmark Village Biota Report, Los Angeles County, California" prepared by Impact Sciences, Inc. (Impact Sciences, 2005).

The approved Newhall Ranch Specific Plan was the subject of extensive environmental review in the previously certified Newhall Ranch Program EIR (State Clearinghouse No. 95011015) and

related Revised Additional Analysis, Volume VIII (May 2003). This Project was assessed at the program level as part of the environmental analysis conducted for the Newhall Ranch Specific Plan. Portions of that analysis, including the certified Flood Section (Section 4.2 – Newhall Ranch Specific Plan EIR) and the certified Revised Additional Analysis (Section 2.3, Floodplain Modifications), have been used in the development of this Project SWMP.

2 ENVIRONMENTAL SETTING

2.1 Physical Setting

The Project site is located within the Newhall Ranch Specific Plan area, which is in an unincorporated portion of Los Angeles County, approximately 30 miles northwest of downtown Los Angeles. The site is in the Santa Clarita Valley, west of Interstate 5. The developed portion of the Project (tract map site) lies between the banks of the Santa Clara River to the south, SR-126 to the north, the confluence of Castaic Creek and the Santa Clara River to the east, and Chiquita Creek to the west (Figure 2-1). For the purposes of this report, the Project developed area refers to the proposed location of the Landmark Village development, while the Project site includes the tract map site, the borrow site and related haul routes, the Chiquito Canyon grading site, the utility corridor, and the potable and reclaimed water tank sites.

The Project boundary depicted on Figure 2-1 includes the developed portion of the Project (tract map site), as well as areas that will be temporarily disturbed during the construction phase of the Project, which includes the borrow site and other areas of grading, and areas where underground utilities will be installed.

The tract map site lies on a flat terrace above the Santa Clara River. The majority of the tract map site is currently used for agricultural purposes and is subject to agricultural disking. Topography across the site is relatively flat, with elevations ranging from 800 feet to 960 feet above mean sea level (msl). Habitat on the project site varies in quality from high biological value in riparian areas adjacent to the Santa Clara River channel, to highly disturbed habitat such as upland agricultural areas. According to the Antelope Valley Area Soil Survey (Soil Conservation Service 1970), nine soil types occur on the Project site: Sandy alluvial land, Metz sandy loam, Hanford sandy loam (0 to 2%), Hanford sandy loam (2 to 9%), Sorrento loam (0 to 2%), River wash, Saugus loam (30 to 50%), Castaic and Saugus soils, and Zamora loam.

Artificial fill has been placed on the tract map site as a result of road construction, oil well drilling activities, utility line placement, agricultural activities and the abandoned Southern Pacific railroad line. Artificial fill also exists at various locations on both borrow sites, ranging from minor spill fills to large dumped fill pads associated with oil well activities.

The borrow site is characterized by sloping hillsides and adjacent agricultural use. The borrow site is dominated by coastal sage scrub and mixed chaparral, but also includes several small areas of non-native grassland and live oak woodland. Elevations on the borrow site range from

approximately 920 feet (near the Santa Clara River) to 1260 feet above msl. The Chiquito Canyon grading site is dominated by agricultural/disturbed areas, non-native grassland and coastal sage scrub vegetation. Elevations at this grading site range from approximately 970 feet (near SR-126) to 1,190 feet above msl.

The drainage area that encompasses the tract map site consists of six sub-basins that independently drain toward the Santa Clara River (Psomas, 2005). There are currently no existing drainage or erosion/sedimentation control improvements located within the site other than minor agricultural drainage ditches and an insignificant amount of earthen bank protection along the Santa Clara River (PACE, 2005). A jurisdictional delineation of waters and streambeds was conducted in accordance with the Army Corps of Engineers (ACOE) protocol in 2003 (Impact Sciences, 2005). The tract map site is generally bordered to the east by Castaic Creek, to the south by the Santa Clara River and to the west by Chiquito Canyon Creek. These drainages are under the jurisdiction of the ACOE. The Chiquita Landfill area drains through an agricultural drain located in the central portion of the tract map site that is also under the jurisdiction of the ACOE. There are no other drainage features within the Project boundaries that are under the jurisdiction of the ACOE.

The Project lies downstream from two water reclamation plants. The Saugus Water Reclamation Plant is located 5 miles upstream from the Project, across Bouquet Canyon Road at Soledad Canyon Road, and the Valencia Water Reclamation Plant is located 1.5 miles upstream, just north of Magic Mountain Parkway at the Old Road. Both treatment plants discharge treated wastewater into reaches of the river lying upstream from the Project.

2.2 Project Area Land Uses

The Project site is located within the Newhall Ranch Specific Plan (NRSP) area, which was approved by the Los Angeles County Board of Supervisors in May 2003. The Newhall Ranch Specific Plan is a comprehensive document that guides future development of the Newhall Ranch property and serves as the zoning for the entire Specific Plan area. The Specific Plan contains a conceptual development plan, development regulations, design guidelines, and implementation mechanisms consistent with the goals, objectives, and policies of the Los Angeles County General Plan and Santa Clarita Area Plan. The NRSP is a large, master-planned development including approximately 21,000 homes and 19,000 jobs, along with recreational and mixed uses and public facilities. A complete description of the land uses included in the NRSP can be found in the Newhall Ranch Specific Plan (SCH # 95011015; February, 1999).

The Land Use Plan contained within the NRSP designates the Landmark Village Project (a portion of the Riverwood Village in the NRSP) for single and multi-family residential, commercial, and recreational land uses (Table 2-1 and Figure 2-2). Existing land use in the developed portion of the Project area consists completely of agricultural production. For modeling purposes, the existing site was assumed to have an imperviousness of 15 percent to account for compaction by machinery and soil saturation due to irrigation.

The Project consists of 1,136 multi-family units, 308 single-family detached units, and a maximum of 1,033,000 square feet of retail/commercial uses. The Project also includes an elementary school, a community park, private recreational facilities and various trail and road improvements.

Table 2-1: Proposed Land Uses Areas within the Landmark Village Development Area

Land Use	Area (Acres)
Single Family Residential	49.9
Multiple Family Residential	81.7
Commercial	36.5
Park/Recreation Center	21.3
Open Space	38.3
Roadway	55.8
School	9.0
Total	292.6

Potable water would be conveyed to the tract map site from two separate water tank sites. One tank is proposed north of the SR-126 within the existing Valencia Commerce Center business park. The second potable water tank would be located within the borrow site, in an area to be graded as part of the proposed soil transfer. The Project would also implement a portion of the Specific Plan's reclaimed water storage and distribution system by installing two reclaimed water tanks in Chiquito Canyon, north of the Chiquito Canyon grading site.

2.3 Project Construction Phase Impact Areas

2.3.1 Borrow Site

Site preparation will include a cut and fill grading operation with fill being imported to the site from a borrow site located south of the tract map site. To elevate the Project development above the floodplain of the Santa Clara River, soil would be imported from a borrow site located within Long/Adobe Canyon (Figure 2-1). The borrow site is located south of the Santa Clara River and is bounded by Long Canyon to the west and the proposed Mission Village development to the east. The total drainage area for the site is about 214 acres and flows generally northwest and westerly. The majority of the land is undeveloped with steep to moderate slopes.

The borrow site grading plan will excavate and reshape the hills and depressions forming the ridge separating Long and Adobe Canyons. Much of this work will occur along the top and bluffs of an unnamed plateau located just west of Sawtooth Ridge. This plateau ranges in elevation from a low of 1,130 feet at its northern most point to a high of 1,220 in the southeast, which is characterized by an increasingly steeper grade. The proposed grading plan would

excavate the southeastern portion of this plateau, creating a gentler slope leading up to the top of the ridge. The resultant manufactured slope angle would range from 5:1 to 2:1 (horizontal/ vertical). The grading plan also alters the western facing slope leading up to the plateau, creating a bench separated by two manufactured slopes stepping down the west-facing ridgeline defining Adobe Canyon at a 3:1 grade.

Additional earthwork is planned at the terminus of Adobe Canyon where a series of excavations will result in a manufactured slope approximately 100 feet in height at a relatively uniform 3:1 grade. A series of benches, swales and debris basins will also be constructed to collect, convey and release runoff in a controlled manner. A maximum of approximately six million cubic yards of earth may be excavated from the Long Canyon/Adobe Canyon area and transported across the Santa Clara River to the tract map site using existing at-grade agricultural crossings. All of this area is within the development footprint approved with the Newhall Ranch Specific Plan.

2.3.2 Chiquito Canyon Grading Site

To accommodate Project-necessitated improvements to SR-126 and debris basins for storm water flows that are collected by the Project storm drainage system, land directly north of SR - 126 and within Chiquito Canyon would be graded.

2.3.3 Utility Corridor

The Project also includes a utility corridor that runs parallel to SR–126, from the western boundary of the tract map site to the approved Newhall Ranch Water Reclamation Plant near the Ventura County line, from the eastern boundary of the tract map site to I-5 and then south to the Los Angeles County Sanitation District 32 Water Reclamation Plant. The utility corridor would serve to extend municipal services to the site. No new impervious surfaces are being added in the utility corridor as the utilities will be placed underground.

2.4 Associated Off-Site Project Components

Improvements to State Route 126 (SR-126) adjacent to the Project are being constructed by Caltrans. A 31.6 acre portion of the SR-126 project is adjacent to and drains into/through the Landmark Village drainage system, and therefore has been included in the Project analysis.

The Castaic Creek/SR-126 Bridge is to be widened to three lanes in each direction. Concurrently, bridge abutments are to be widened to approximately 500 LF of creek length of reinforced concrete transitioning to soil cement through 50 linear foot of creek length of rip-rap.

2.5 Proposed Drainage Improvements – Project and Santa Clara River

The proposed improvements on the Project site that would occur in and adjacent to the Santa Clara River, including bank stabilization, storm drain outfalls and associated energy dissipators, and construction of Long Canyon Road Bridge across the River are described below. At limited

locations on the Project site, such as at outlet structures, access ramps, or bridge abutments, grouted rip-rap or reinforced concrete would be used to minimize erosion. Approximately three percent of the Santa Clara River along the Project site would be improved with rip-rap or reinforced concrete in combination with soil cement, approximately 47 percent of the Santa Clara River banks would be protected using buried soil cement, and the remaining 13 percent would be protected using turf reinforcement mats. In total, 63 percent of the Santa Clara River banks fronting the Project would be protected (PACE, 2005).

2.5.1 Proposed Project Drainage Improvements

Runoff from the six off-site drainage areas that drain through or onto the Project site, as defined by the Psomas Landmark Village Drainage Concept Report (Psomas, 2005) would continue to flow through the Project site. Runoff from the developed portions of the Project would be channeled through the proposed stormwater conveyance system and would be discharged to the Santa Clara River through 11 new outfalls after passing through the water quality treatment BMPs (see Section 5.3 for further detail). As required in the Los Angeles County Department of Public Works memorandum entitled, "Level of Flood Protection and Drainage Protection Standards," all on-site drainage systems carrying runoff from developed areas are to be designed for the 25-year Design Storm (Urban Flood), while storm drains under major and secondary highways, open channels (main channels), debris carrying systems, and sumps will be designed for the Capital Flood.

2.5.2 Energy Dissipaters

To reduce storm flow velocities and prevent erosion at stormwater discharge points into the River, energy dissipaters consisting of either rip-rap or other larger reinforced concrete standard impact-type energy dissipaters would be constructed at the 11 storm drain outlets into the River. These energy dissipaters would slow the rate of flow of runoff into the River to prevent erosion of the stream channel. Additional dissipaters would be located at the outlet of Chiquito Creek and Long Canyon Creek.

2.5.3 Long Canyon Road Bridge

The Long Canyon Road Bridge over the River is to be located 500 feet upstream of the Long Canyon Creek discharge to the River. The bridge's proposed span is approximately 980 LF with eleven piers within the River along the span. Bridge abutments are approximately 500 LF of River length of reinforced concrete transitioning to soil cement through 50 LF of River length of rip-rap.

2.5.4 Bank Stabilization

The Conceptual Backbone Drainage Plan of the Newhall Ranch Specific Plan provides drainage and flood control protection to developed uses while preserving the Santa Clara River as a

natural resource. The Drainage Plan utilizes several criteria that are to be implemented by projects that develop within the Specific Plan area. The primary criteria are as follows:

- Flood corridor must allow for the passage of Los Angeles County Capital Flood discharge without the permanent removal of natural River vegetation (except at bridge crossings);
- The banks of the River will generally be established outside of the "waters of the United States" as defined by federal laws and regulations and as determined by the delineation completed by the ACOE in August 1993;
- Where the ACOE delineation width is insufficient to contain the Capital Flood flow, the flood corridor will be widened by an amount sufficient to carry the Capital Flood flow without the necessity of permanently removing vegetation or significantly increasing velocity; and
- Soil cement will occur only where necessary to protect against erosion adjacent to the proposed development. Where existing bluffs are determined to be stable and there is no adjacent proposed development, no bank protection will be built.

The Project would include buried soil cement along the Santa Clara River and Castaic Creek adjacent to and downstream of the Project site. In total, approximately 17,700 linear feet (LF) of bank, would be provided with buried soil cement protection. This would include approximately 10,900 feet fronting the Project site and approximately 6,800 LF on the south bank adjacent to the Long Canyon Road Bridge.

Most of the proposed bank protection would consist of buried soil cement to provide scour and freeboard flood control protection. Soil cement bank protection provides a stable riverbank protection material, in terms of both surface erosion and structural stability. Additionally, soil cement bank protection will be mostly buried. The exposed top portion of the soil cement will be aesthetically and vegetatively compatible with the natural earth and vegetated bank area.

Bank stability protection along the Newhall Ranch SR-126/River utility corridor would be provided by installing approximately 4,700 LF of turf reinforcement mats (TRMs) along the north bank of the River from the western end of the Project to the easterly end of the proposed Newhall Ranch Water Reclamation Plant. TRMs are designed to reinforce vegetation at the root and stem allowing vegetation to be used as erosion control in areas where flow conditions exceed the ability of natural vegetation to remain rooted. This includes applications with high slopes or stream banks where grouted rip-rap and concrete channels are aesthetically undesirable.

The proposed reinforced concrete and rip-rap at bridge abutments, in addition to the soil cement, would encroach into the existing FEMA 100-year flood plain in some areas (PACE, 2005). Approximately 215 acres of existing Santa Clara River channel would be encroached upon by

the proposed improvements. In other areas, the soil cement would be placed outside the existing River channel, creating additional new River channel. For example, soil cement proposed on the north side of the River near the confluence with Castaic Creek would be constructed on agricultural land, north of the existing channel. The land located between the existing River bank and the newly created stabilized bank would be excavated to widen the existing channel, which would increase the area available within the channel and increase the capacity of the River to convey the passage of flood flows. Floodway encroachment impacts are evaluated in the Flood Technical Report (PACE, 2005).

2.6 Receiving Water Bodies and Beneficial Uses

2.6.1 Santa Clara River

The Project will discharge from its storm drain and water quality control facilities directly to the Santa Clara River Reach 7_E[1], immediately downstream of its confluence with Castaic Creek. In the Project area, downstream of the Saugus Water Reclamation Plant (WRP) (Reach 8_E) and Valencia WRP (Reach 7_E), the SCR is perennial with the majority of flow from WRP effluent. Flows in the SCR can also be affected by groundwater dewatering operations or by diversions for agriculture or groundwater recharge.

The tentative map site comprises 292.6 gross acres within a 568 acre drainage area within the 1,618 square-mile Santa Clara River Basin Watershed.

The Water Quality Control Plan for the Los Angeles Region (Basin Plan) (LARWQCB, 1994, as amended) lists beneficial uses of major water bodies within this region (Table 2-2). Santa Clara River Reach 7_E is listed and has specific beneficial uses assigned to it.

Table 2-2: Beneficial Uses of Receiving Waters

Water Body	Beneficial Uses[1]														
	MUN	IND	PROC	AGR	GWR	FRSH	REC1	REC2	WARM	COLD	WILD	RARE	MIGR	SPWN	WET[1]
Santa Clara River (Hydrologic Unit 403.51)	P*	E	E	E	E	E	E	E	E		E	E			E

[1]Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.

[1] The SCR is divided into reaches for purposes of establishing beneficial uses and water quality objectives. However, there are two reach classifications, one established by the Los Angeles Regional Water Quality Control Board (LARWQCB) and one established by the United States Environmental Protection Agency (EPA). Both of these reach classifications are used by the LARWQCB and the EPA in various documents, which at times is a source of confusion. This report will use the EPA reach numbers, designated as "E".

E – Existing beneficial use; P – Potential beneficial use; I – Intermittent beneficial use *Asterixed MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemptions at a later date.
Source: Water Quality Control Plan for the Los Angeles Region (Basin Plan) (LARWQCB, 1994, as amended)

As identified in Table 2-2 above, the existing, potential and intermittent beneficial uses of Santa Clara River Reach 7_E include the following:

- MUN: Community, military, or individual water supply systems including, but not limited to, drinking water supply (a potential beneficial use)
- IND: Industrial activities that do not depend primarily on water quality
- PROC: Industrial activities that depend primarily on water quality
- AGR: Agricultural supply waters used for farming, horticulture, or ranching
- GWR: Groundwater recharge for natural or artificial recharge of groundwater
- REC1: Water contact recreation involving body contact with water and ingestion is reasonably possible
- REC2: Non-contact water recreation for activities in proximity to water, but not involving body contact
- WARM: Warm freshwater habitat to support warm water ecosystems
- WILD: Wildlife habitat waters that support wildlife habitats
- RARE: Waters that support rare, threatened, or endangered species and associated habitats
- WET: Wetland ecosystems

Downstream of the Saugus Water Reclamation Plant (WRP) (Reach 8_E) and Valencia WRP (Reach 7_E), the SCR is perennial past the Los Angeles/Ventura County line (Systech, 2002) to approximately Rancho Camulos. Flows in the SCR can also be affected by groundwater dewatering operations or by diversions for agriculture or groundwater recharge. Throughout the Santa Clara River channel, there are complex surface water/groundwater interactions where both gaining and losing river segments are found. The river section between the county line and Fillmore is known as the "dry gap" because it rarely contains surface water (Systech, 2002).

The reach of the SCR within and adjacent to the Project site has multiple channels (braided). This kind of system is characterized by high sediment loads, high bank erodibility, and intense and intermittent runoff conditions. Combined with the relatively flat gradient of the SCR at this point (less than one percent), the SCR has a high potential to aggrade (deposit sediment) at low flow velocities (PACE, 2005).

The existing SCR channel contains a variety of vegetation types. The active SCR channel is mostly barren due to annual scouring. However, vegetation types on the adjacent terraces vary based on elevation relative to the active channel bottom and the frequency of flooding. The following series of vegetation types occur along a vertical gradient from the channel bottom to the highest SCR terrace on the floodplain: emergent herbaceous, woody shrubs, and trees.

The substrate of the SCR channel (i.e., top layer of the SCR bottom) is primarily sand, which is actively eroded and deposited in flood events. Previous studies (Simons and Li) by the Los Angeles County Flood Control District have demonstrated that sediment deposition and scouring along the upper Santa Clara River are generally in equilibrium, and that there are no major trends of channel degradation or aggradation. However, some localized areas may experience either greater scouring or deposition (PACE, 2005).

2.7 Tributaries to the Santa Clara River

Several tributaries to the Santa Clara River drain into or adjacent to the Project site, including Chiquita Creek on the River's north bank, Long Canyon Creek on the south bank, and Castaic Creek, which enters the River upstream of the Project site (Figure 2-1). Project runoff from the developed portion of the Project will not be discharged to the tributaries; all Project runoff will be discharged to the Santa Clara River after receiving treatment in the Project PDFs.

The Chiquita Creek drainage is approximately 4.8 square miles, with a stream length of approximately 22,000 feet. The Long Canyon Creek drainage area is approximately 1.5 square miles, with a stream length of approximately 1,000 feet. The Castaic Creek watershed, the largest of the tributary watersheds, is approximately 16.8 square miles below the Castaic Lake dam. The Project is bounded by Castaic Creek to the east and Chiquito Creek to the west. Long Canyon Creek is downstream of the Project site to the west.

2.8 Existing Receiving Water Quality

The existing wet weather surface water quality in the NRSP subregion was characterized from available water quality monitoring data obtained from the following three sources:

1. Newhall Ranch Stormwater Monitoring. Two storm events were monitored in Potrero Canyon, San Martinez Canyon, Middle Canyon, Chiquito Canyon, and an unnamed tributary in Long Canyon. While these data are limited, they are the most relevant in terms of characterizing the existing stormwater runoff within the NRSP subregion.

2. LA County Monitoring. The County of Los Angeles recently initiated in-stream monitoring on the mainstem of the SCR at a mass emission station upstream of the NRSP subregion. Both dry-weather and wet-weather monitoring data are available. The LA County monitoring data are the most current and are the only source of wet-weather monitoring in the SCR immediately upstream of the NRSP subregion.

3. USGS Monitoring. The USGS collected a large number of water quality data in the SCR near the county line, from 1951 through 1995. These data provide a historical perspective of wet weather water quality in the SCR immediately downstream from the NRSP subregion.

2.8.1 Newhall Ranch Monitoring – NRSP Subregion Stormwater Monitoring

Newhall Land conducted stormwater monitoring of tributary streams in the NRSP subregion to characterize the existing surface water quality during wet weather conditions. Stormwater samples were collected during two storm events in March 2001. The stormwater samples were collected at five monitoring locations (Stations A-E) shown on Figure 2-1. Three of the five monitoring stations were located at the mouths of SCR tributaries in Potrero (Sta. A), San Martinez (Sta. B), and Middle Canyons (Sta. D). The other two monitoring stations were located on tributaries upstream from the mainstem of the SCR; one was just downstream of the community of Val Verde in Chiquito Canyon (Sta. E) and one was on an unnamed tributary in Long Canyon, ¼ mile upstream of the 'Onion Field' (Sta. C). Aside from Station E, which is downgradient of residential land use, the land uses in the areas tributary to the Stations A, B, C, and D are predominately open space with some agriculture and oil and gas operations.

Table 2-3 lists the rainfall depth and duration of the two monitored storm events. The first storm was a small event (0.2 inches) that was likely just large enough to result in stormwater runoff. The depth of the second event was larger and was equal to the median depth (0.7 inches) at the nearby National Climatic Data Center (NCDC) Newhall rain gauge (see location on Figure 2-1). The median depth of 0.7 inches is based on a storm event analysis which identified 452 storms exceeding 0.1 inches that occurred from October 1968 to September 1999.

Table 2-3: Depth and Duration of Storms Monitored at Project Site

Date	Depth (in)[1]	Duration (hours)[1]
03/06/01	0.2	3
03/08/01	0.7	10

[1] Based on rainfall measured at the Newhall rain gauge.

Average concentrations of the Newhall Ranch Stormwater Monitoring data are summarized in Table 2-4. The monitoring data are presented in their entirety in Appendix D.

Table 2-4: Average Concentrations of Selected Constituents from Newhall Ranch Stormwater Monitoring

Constituent	Site A Mouth of Potrero	Site B Mouth of San Martinez	Site C Upstream of Onion Field	Site D Mouth of Middle Cyn	Site E Middle of Chiquito
TSS (mg/L)	835	41100	36000	5650	6645
TDS (mg/L)	7380	2825	190	160	205
Hardness (mg/L as $CaCO_3$)	2225	1205	147	58.5	107
Chloride (mg/L)	870	125	3	3	10.5
Nitrate-N (mg/L)	17.5	3.0	1.6	15.3	2.8
Total Copper (µg/L)	15	175	170	10	70
Total Lead (µg/L)	6.1	53.5	95.2	7.6	36.8
Total Zinc (µg/L)	40	330	330	30	225
Total Cadmium (µg/L)	0.3	11.2	2	0.4	1.9
Total Coliform (MPN/100ml)	40000	>160000	125000	>50000	>81200
Fecal Coliform (MPN/100ml)	4300	953	6300	>81200	81200

TSS. It is generally expected that TSS concentrations in alluvial streams will be elevated because of the combination of high sediment supply and instream transport and erosion. TSS concentrations in Table 2-4 are very high, due to the highly erodible, sandy alluvial soils in the tributary canyons. Highest TSS concentrations were measured at sites B and C, which were almost an order of magnitude greater than the other sites.

TDS. Total dissolved solids (TDS) are a measure of the dissolved cations and anions, primarily inorganic salts (calcium, magnesium, potassium, sodium, chlorides and sulfates). TDS is an impairing pollutant in Reach 3_E of the SCR as listed in the State's 2002 303(d) list of impaired water bodies. High TDS levels can impair agricultural, municipal supply, and groundwater recharge beneficial uses. Stormwater monitoring data collected in the NRSP subregion (Table 2-4) show differing TDS levels among the five monitoring stations. Measured TDS concentrations were very high at Sites A and B, while TDS concentrations at the other three sites were low to moderate. Sites A and B are located on the most downstream tributaries of the five monitoring stations in the NRSP subregion. Elevated TDS levels in runoff from these drainages is likely a result of the natural soil properties of the marine layers of the Pico formation, and the high groundwater table conditions in these two canyons, suggesting that groundwater discharges to the streams contributed to the elevated TDS levels.

Hardness. Hardness is a measure of the polyvalent cations, primarily calcium and magnesium. Hardness measurements are important because the toxicity of metals (and the associated water

quality objectives) is an inverse function of the hardness. The stormwater monitoring data for hardness in the NRSP subregion (Table 2-4) were analogous to the data for TDS. Hardness concentrations were very high at Sites A and B, and low to moderate at the other three sites. High hardness at Sites A and B located on the downstream tributaries could be due to natural high levels of calcium and magnesium in the local soils (such as lime and gypsum deposits), and the high groundwater table conditions in these two canyons, suggesting again that groundwater discharges contributed to the elevated hardness levels.

Chloride. High levels of chloride in Santa Clara River Reaches 3_E, 7_E, and 8_E are causing impairment of listed beneficial uses for agricultural irrigation. Irrigation of salt sensitive crops such as avocados and strawberries with water containing elevated levels of chloride can result in reduced crop yields. As with TDS and hardness, monitoring data collected in the NRSP subregion (Table 2-4) found very high chloride concentrations at Site A, high levels at Site B, and lower concentrations at the remaining three sites.

Nutrients. Nitrate-nitrogen was the only nutrient measured in the NRSP subregion stormwater monitoring. As shown in Table 2-4, measured nitrate-nitrogen concentrations were generally low (less than 3 mg/L as N) at three of the sites, and were elevated at Sites A and D (17.5 mg/L and 15.3 mg/L, respectively). High nitrate levels can be associated with runoff from agricultural areas and nurseries, or associated with excessive fertilization of landscape areas in residential areas.

Metals. Table 2-4 presents average total copper, lead, zinc, and cadmium concentrations measured in the NRSP subregion stormwater monitoring. High concentrations of total copper, lead, and zinc were measured at Sites B, C, and E, and low to moderate concentration were measured at Sites A and D. Moderately high concentrations of total cadmium were also detected at Site B.

Elevated total metal concentrations are often associated with elevated TSS levels. Such trends are somewhat evident in the monitoring data, which exhibited highest total metal concentrations at sites with the highest TSS concentrations (Site B, C, and E). Site D, however, also had high TSS concentrations but low to moderate levels of total metal concentrations.

Indicator Bacteria. Pathogens are viruses, bacteria, and protozoa that cause illness in humans. The presence of fecal indictor bacteria (FIB) indicates the presence of fecal contamination and the potential presence of associated pathogenic organisms; however, it does not indicate the source of the contamination. There are numerous natural and anthropogenic sources of pathogen indicators. The average fecal coliform concentrations at monitoring Sites A, B, and C ranged from about 1,000 to 6,000 MPN/100 mL, which represents medium concentrations. Monitoring data from Sites D and E showed high fecal coliform concentrations, more than an order of magnitude greater than Sites A, B, and C.

2.8.2 LA County Department of Public Works Monitoring Data

The Los Angeles County Department of Public Works (LACDPW) initiated dry- and wet-weather monitoring in the Santa Clara River in the 2002/2003 season (LACDPW, 2003). The monitoring station (S29) is located in Santa Clara River Reach 8_E at The Old Road (Figure 2-1). It is approximately two miles upstream from the eastern boundary of the Project area. The monitoring station is downstream of the Saugus Water Reclamation Plant and upstream of the Valencia Water Reclamation Plant. The monitoring station is intended to provide long-term information about water quality trends in areas with heterogeneous land uses and has a tributary area of 411 square miles. Land use in the tributary area is 87 percent open space, 4.3 percent urban development, and 8.7 percent other land uses (LACDPW, 2003).

Monitoring at the mass emission station in 2002-2003 included four storm events. Table 2-5 lists the rainfall depth and duration of the four monitored storm events based on hourly rainfall measurements at the Newhall rain gage. The depth of each of the storms was greater than the median storm depth for the Newhall rain gage (0.70 inches). In particular, the storm event beginning on 2/11/03 was a very large event, with a total storm depth of almost 8 inches. Due to these large storm sizes, pollutant concentrations of samples may be highly diluted and not representative of concentrations in more frequent storm events. During large storm events, samples taken after the initial wash off of pollutants will generally have much lower pollutant concentrations. Also, groundwater effects, which increase hardness, are highly diluted.

Table 2-5: Depth and Duration of Storms Monitored by LACDPW at S29

Date	Rainfall Depth (inches)[1]	Storm Duration (hours)[1]
11/8/2002	1.6	21
12/16/2002	1.9	5
2/11/03	7.9	29
3/15/03	1.0	14

[1] Based on rainfall measured at the Newhall rain gage

Table 2-6 lists summary statistics of the monitoring data collected at the SCR mass emission station for the four events listed in Table 2-5. Comparison of these in-stream wet-weather monitoring data with the tributary monitoring data in the NRSP subregion (Table 2-4) indicates the following:

TSS. The average in-stream TSS concentration at the mass emission station was considerably lower than the average TSS concentrations measured in the NRSP subregion tributaries, most likely due to the large storm events that were monitored.

Hardness, TDS, and Chloride. The average in-stream concentrations of hardness, TDS, and chloride at the mass emission station were comparable with average concentrations in the three upstream tributary monitoring stations (Sites C, D, and E). This is consistent with the location of

the mass emission station upstream of the tributary monitoring stations. The average concentrations found in the two downstream tributary stations (Sites A and B) were considerably higher than average concentrations at the upstream tributary stations and at the mass emission station.

Nutrients. In-stream nutrient concentrations were generally low. Only nitrate data was collected in the tributary monitoring stations. The average in-stream nitrate concentration at the mass emission station was lower, but generally comparable with the average concentrations at three of the five tributary monitoring stations (Sites B, C, and E). The nitrate concentrations at the other two tributary monitoring stations were comparatively much higher.

Metals. The average in-stream concentration for total metals was comparable to average concentrations at two of the five tributary monitoring stations (Sites A & D). Average total metal concentrations measured at the other three tributary monitoring sites (Sites B, C, and D) were much higher than the average in-stream concentrations at the mass emission station.

Indicator Bacteria. The average in-stream FIB concentration at the mass emission station was comparable to average concentrations at two of five tributary monitoring stations (Sites D & E). Concentrations of indicator bacteria in wet-weather flows at all monitoring stations were very high.

Table 2-6: Summary Results of LACDPW Stormwater Monitoring at the SCR Mass Emission Station (S29) during 2002-2003

Parameter	No. of Samples	No. of Detects	Minimum	Maximum	Average
General & Conventional Parameters					
TSS (mg/L)	4	4	53	712	353
Hardness (mg/L)	4	4	15.2	131	92
TDS (mg/L)	4	4	28	278	197
Chloride (mg/L)	4	4	2.58	39.8	22
Oil & Grease (mg/L)	4	2	1.7	3.1	2.4
Nutrients					
Dissolved phosphorus (mg/L)	4	4	0.16	0.38	0.28
Total phosphorus (mg/L)	4	4	0.29	0.44	0.36
Nitrate-N (mg/L)	4	4	0.52	1.11	0.82
Nitrite-N (mg/L)	4	2	0.26	0.87	0.56
Ammonia-N (mg/L)	4	2	0.34	1.09	0.71
TKN (mg/L)	4		0.66	2.62	1.72
Metals					
Dissolved copper (ug/L)	4	4	3.8	8.4	7

Parameter	No. of Samples	No. of Detects	Minimum	Maximum	Average
Total copper (ug/L)	4	4	9.4	32.9	16
Dissolved lead (ug/L)	4	2	1.0	2.3	1.6
Total lead (ug/L)	4	4	1.1	14.5	5.6
Dissolved zinc (ug/L)	4	4	27	37	32
Total zinc (ug/L)	4	4	42	103	63
Dissolved cadmium (ug/L)	4	0	--	--	--
Total cadmium (ug/L)	4	2	0.25	0.6	0.43
Indicator Bacteria					
Total coliform (MPN/100mL)	4	4	50000	500000	272500
Fecal coliform (MPN/100mL)	4	4	9000	170000	92750
Fecal Enterococcus (MPN/100mL)	4	4	17000	240000	96750
Pesticides					
Chlorpyrifos (ug/L)	4	0	--	--	--
Diazinon (ug/L)	4	3	0.05	0.43	0.25

2.8.3 USGS Water Quality Monitoring Data

The US Geological Survey (USGS) has collected stream flow and water quality data at a number of locations in the SCR watershed (http://waterdata.usgs.gov/nwis). Among the largest data sets are flow and water quality data collected at USGS station 11108500 located on the Santa Clara River just downstream of the Los Angeles / Ventura County Line. This station is located approximately one mile downstream of the NRSP subregion (Figure 2-1).

The USGS collected water quality data at the Los Angeles / Ventura County Line station between April 1951 and October 1995. These data thus provide an historical perspective of water quality in the SCR within the NRSP subregion. To facilitate interpretation, the water quality data were grouped into two categories depending on the depth of 2-day antecedent rainfall measured at the Newhall rain gauge:

1. ***0.1 – 1 inches.*** Rainfall depths that would likely produce runoff volumes characteristic of more frequent, smaller storm events

2. ***> 1 inch.*** Rainfall depths that would likely produce runoff volumes characteristic of larger, less frequent storm events

Table 2-7 summarizes the USGS data for selected general constituents. Comparison of the historical water quality data at the USGS station (Table 2-7) with the more recent wet weather monitoring data summarized in Table 2-4 and Table 2-6 above indicates the following:

Hardness. The average hardness concentration decreased with larger antecedent rainfall depth. This trend was consistent with the more recent wet weather monitoring in or near the NRSP subregion; however, the magnitude of hardness concentrations was somewhat inconsistent. Average hardness concentrations at most of the stormwater monitoring stations upstream of the USGS station was about 100 mg/L as $CaCO_3$, which is lower than the average hardness concentration of 546 mg/L as $CaCO_3$ to 773 mg/L as $CaCO_3$ at the USGS station. Exceptions were the very high hardness concentrations detected at the Potrero Canyon and San Martinez Canyon monitoring stations, which are upstream of the USGS station. It is possible that average concentrations in storm flows at the USGS station reflected a combination of the lower concentrations measured at the upstream locations and the higher hardness concentrations measured in the two downstream tributary locations.

TSS. TSS concentrations at the USGS monitoring station increased substantially in storm flows and were generally in the range of 2,000 to 10,000 mg/L (Table 2-7). These values were consistent with the Newhall stormwater monitoring results in the NRSP subregion tributaries (Table 2-4).

TDS. Table 2-7 summarizes results for specific conductance (that is, the extent to which the sample conducts an electric current), which can be related to TDS concentration. As a rough rule-of-thumb, TDS concentration can be estimated as 0.64 times the specific conductance (USDI, 1998). Using this rule-of-thumb, the average TDS concentrations at the USGS station ranged from about 800 mg/L to 1,400 mg/L for storm flows. These average concentrations were greater than the recent monitoring information. Average TDS concentrations at most of the recent stormwater stations was about 200 mg/L, with the exception of the very high TDS concentrations at the Potrero Canyon and San Martinez Canyon monitoring stations.

Chloride. Average chloride concentrations at the USGS station were about 60 mg/L to 122 mg/L for storm flows. This is generally consistent with the recent monitoring data. Average chloride concentrations in recent monitoring ranged between 3 mg/L to 120 mg/L, with the exception of the very high chloride concentrations detected at the mouth of Potrero Canyon.

Table 2-7: USGS Water Quality Data for Selected General Constituents in the Santa Clara River at the County Line

Constituent & 2-day Preceding Rainfall (in)	Sample Dates	No. of Samples	Minimum	Maximum	Average	Median
Hardness (mg/L)						
0.1 – < 1.0 inches	5/51 – 12/85	27	270	1500	773	660
≥1.0 inches		37	250	1200	546	470
TSS (mg/L)						
0.1 – < 1.0 inches	11/70 – 9/88	10	248	4730	2291	2345
≥ 1.0 inches		41	107	51200	10711	5270

Constituent & 2-day Preceding Rainfall (in)	Sample Dates	No. of Samples	Minimum	Maximum	Average	Median
Specific Conductance (uS/cm)						
0.1 – < 1.0 inches	4/51 – 10/95	33	831	4220	2246	1720
≥ 1.0 inches		42	637	3240	1309	1100
Chloride (mg/L)						
0.1 – < 1.0 inches	4/51 – 4/92	34	21	290	122	111
≥ 1.0 inches		39	14	192	61	47

Table 2-8 summarizes the USGS data for selected nutrients. Comparison of the historical nutrient data at the USGS station (Table 2-8) with the recent nutrient monitoring data (Table 2-4 and Table 2-6) indicates the following:

Phosphorus. Average total phosphorus concentrations at the USGS station were about 1.0 to 1.3 mg/L and appear to be somewhat independent of storm event size. Recent wet weather monitoring also showed somewhat consistent total phosphorus levels, but at a slightly lower magnitude of about 0.4 to 0.6 mg/L.

Nitrogen. The average nitrate-N + nitrite-N concentration at the USGS station varied from 2.1 mg/L for lower storm flows to 1.7 mg/L for higher storm flows. Most of the more recent monitoring data summarized in Tables 2-4 and 2-6 above were similarly low (1.1 mg/L to 3.0 mg/L), except for Newhall tributary stations A and D, which had elevated average nitrate-N concentrations (17.5 mg/L and 15.3 mg/L, respectively).

Table 2-8: USGS Water Quality Data for Selected Nutrients in the Santa Clara River at the County Line

Constituent & 2-day Preceding Rainfall (in)	Sample Dates	No. of Samples	Minimum	Maximum	Average	Median
Dissolved phosphorus (mg/L)						
0.1 – < 1.0 inches	3/79 – 4/92	3	0.35	0.66	0.46	0.36
≥ 1.0 inches		1			0.01	
Total phosphorus (mg/L)						
0.1 – < 1.0 inches	8/74 – 9/88	5	0.81	1.8	1.28	1.10
≥ 1.0 inches		2	0.63	1.4	1.02	1.02
Ammonia as N (mg/L)						
0.1 – < 1.0 inches	10/79 – 4/92	3	0.03	0.39	0.16	0.07
≥ 1.0 inches		0				
Nitrate + Nitrite as N (mg/L)						
0.1 – < 1.0 inches	8/71 –	7	0.87	4	2.1	2.2

Constituent & 2-day Preceding Rainfall (in)	Sample Dates	No. of Samples	Minimum	Maximum	Average	Median
≥ 1.0 inches	4/92	4	1.2	2	1.7	1.8
TKN as N (mg/L)						
0.1 – < 1.0 inches	3/79 – 4/92	1			0.64	
≥ 1.0 inches		1			0.69	
Total Nitrogen (mg/L)						
0.1 – < 1.0 inches	8/74 – 9/81	2	0.6	2.2	1.4	
≥ 1.0 inches		2	3.5	4.4	4.0	

Table 2-9 summarizes the USGS data for selected metals, pesticides, and FIB constituents. Comparison of the historical water quality data at the USGS station (Table 2-9) with the recent wet weather monitoring data (Tables 2-4 and Table 2-6) indicates the following:

Metals. Available data for trace metals at the USGS station are limited. For copper and lead, there were a considerable number of non-detects with very high detection limits. Therefore, comparison of the USGS data for copper, lead, and zinc with the recent monitoring information is considered inappropriate.

FIB. There were only four measurements of fecal coliform concentration corresponding to storm flows at the USGS station, and the single measurement corresponding to large storm flows showed an elevation in fecal coliform levels.

Pesticides. Diazinon was detected in one wet weather sample in the historical data.

Table 2-9: USGS Water Quality Data for Selected Metals, Pesticides and Indicator Bacteria in the Santa Clara River at the County Line

Constituent & 2-day Preceding Rainfall (in)	Sample Dates	No. of Samples	No. > Detect Limit	Minimum	Maximum	Average	Median
Dissolved Copper (ug/L)							
0.1 – < 1.0 inches	6/73 – 9/88	4	0	-	-	-	-
Total Copper (ug/L)							
0.1 – < 1.0 inches	4/79 – 9/82	1	1	-	-	30	-
Dissolved Lead (ug/L)							
0 – < 0.1 inches	6/73 – 9/88	39	4	1	23	7.8	3.5
0.1 – < 1.0 inches		4	0				

Constituent & 2-day Preceding Rainfall (in)	Sample Dates	No. of Samples	No. > Detect Limit	Minimum	Maximum	Average	Median
Total Lead (ug/L)							
0.1 – < 1.0 inches	8/74 – 9/82	3	0	-	-	-	-
≥1.0 inches		1	0	-	-	-	-
Dissolved Zinc (ug/L)							
0.1 – < 1.0 inches	5/75 – 9/88	4	1	-	-	10	-
Total Zinc (ug/L)							
0.1 – < 1.0 inches	4/79 – 9/82	1	1	-	-	150	-
Fecal Coliform (CFU/100mL)							
0.1 – < 1.0 inches	3/79 – 9/88	3	3	80	720	427	480
≥1.0 inches		1	1	-	-	2700	-
Diazinon (ug/L)							
0.1 – < 1.0 inches	8/74 – 6/76	1	1	-	-	0.02	-

2.9 Groundwater

The geology within and adjacent to the Project area consists of relatively thin alluvial deposits (Alluvium) overlying a deeper, relatively thick Saugus Formation. Both the Alluvium and Saugus Formation contain water-bearing sediments capable of becoming saturated so as to provide water to wells. These water-bearing sediments constitute the local "groundwater reservoir" for the Santa Clarita Valley. The upper basin, called the Alluvium or Alluvial Aquifer, generally underlies the Santa Clarita Valley and side canyons. The main river valley consists of medium-grained sand on the west to cobbly sand in the east. Due to the unconsolidated to poorly consolidated condition of the Alluvium, and its lack of cementation, the Alluvium has relatively high permeability and porosity.

The Project area is within the Santa Clarita Valley Groundwater Basin, East Subbasin and is located in the Bouquet and San Francisquito Canyon division of that subbasin. Beneficial uses for groundwaters for this subbasin are shown in Table 2-10.

Table 2-10: Beneficial Uses of Groundwaters

Groundwater Basin	MUN	IND	PROC	AGR	AQUA*
DWR 4.07 - Eastern Santa Clara Sub-basin: Santa Clara-Bouquet and San Francisquito Canyons	E	E	E	E	

E-Existing Beneficial Use
*Beneficial Use Definitions are provided above in Section 2.4.1 with the exception of AQUA- Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.
Source: Water Quality Control Plan for the Los Angeles Region (Basin Plan) (LARWQCB, 1994 as amended)

3 REGULATORY SETTING

3.1 Clean Water Act

In 1972, the Federal Water Pollution Control Act [later referred to as the Clean Water Act (CWA)] was amended to require National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants to waters of the United States from any point source. In 1987, the CWA was amended to require that the United States Environmental Protection Agency (EPA) establish regulations for permitting of municipal and industrial stormwater discharges under the NPDES permit program. The EPA published final regulations regarding stormwater discharges on November 16, 1990. The regulations require that municipal separate storm sewer system (MS4) discharges to surface waters be regulated by a NPDES permit.

In addition, the CWA requires the States to adopt water quality standards for receiving water bodies and to have those standards approved by the EPA. Water quality standards consist of designated beneficial uses for a particular receiving water body (e.g. wildlife habitat, agricultural supply, fishing etc.), along with water quality criteria necessary to support those uses. Water quality criteria are prescribed concentrations or levels of constituents – such as lead, suspended sediment, and fecal coliform bacteria – or narrative statements which represent the quality of water that support a particular use. Because California had not established a complete list of acceptable water quality criteria, EPA established numeric water quality criteria for certain toxic constituents in receiving waters with human health or aquatic life designated uses in the form of the California Toxics Rule ("CTR") (40 CFR 131.38).

3.2 CWA Section 303(d) - TMDLs

When designated beneficial uses of a particular receiving water body are being compromised by water quality, Section 303(d) of the CWA requires identifying and listing that water body as "impaired". Once a water body has been deemed impaired, a Total Maximum Daily Load (TMDL) must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, non-point, and natural sources that a water body may receive

without exceeding applicable water quality standards (with a "factor of safety" included). Once established, the TMDL allocates the loads among current and future pollutant sources to the water body.

The Landmark Village Project will discharge stormwater and runoff to Santa Clara River Reach 7_E. Table 3-1 lists the water quality impairments for the Santa Clara River mainstem as reported on the 2002 CWA Section 303(d) List of Water Quality Limited Segments, at and downstream of the Project location. Reach 7_E of the Santa Clara River is listed for chloride, coliform, and nitrate-nitrogen plus nitrite-nitrogen. Downstream segments of the river are listed for ammonia, chloride, coliform, historical pesticides, and Total Dissolved Solids (TDS).

The Regional Board has adopted TMDLs for nitrogen compounds, including nitrate plus nitrite-nitrogen and ammonia, and chloride into the Water Quality Control Plan for Los Angeles Region (Basin Plan). The waste load allocations for stormwater discharges into Reach 7_E of the Santa Clara River are summarized in Table 3-2. Pollutant reductions are regulated through effluent limits prescribed in POTW and minor point source NPDES Permits, Best Management Practices (BMPs) required in NPDES MS4 Permits, and State Water Resource Control Board (SWRCB) Management Measures for nonpoint source discharges. The Regional Board has not yet adopted a TMDL for coliform in Reach 7_E .

3.3 California Toxics Rule

The California Toxics Rule (CTR) is a federal regulation issued by the USEPA providing water quality criteria for potentially toxic constituents in receiving waters with human health or aquatic life designated uses in the State of California. CTR criteria are applicable to the receiving water body and therefore must be calculated based upon the probable hardness values of the receiving waters for evaluation of acute (and chronic) toxicity criteria. At higher hardness values for the receiving water, copper, lead, and zinc are more likely to be complexed (bound with) components in the water column. This in turn reduces the bioavailability and resulting potential toxicity of these metals.

Due to the intermittent nature of stormwater runoff (especially in Southern California), the acute criteria are considered to be more applicable to stormwater conditions than chronic criteria and therefore are used in assessing Project impacts. For example, the average storm duration in the 34-year Newhall gage rainfall record is 12 hours. Acute criteria represent the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time without deleterious effects; chronic criteria equal the highest concentration to which aquatic life can be exposed for an extended period of time (four days) without deleterious effects.

The minimum wet-weather hardness value of 250 mg/L as $CaCO_3$ from USGS station 11108500 was used to approximate CTR criteria for metals. This value is likely to be more representative of conditions in the Santa Clara River below Castaic Creek than the SCR Station 29 based on the water quality data summarized in Section 2.7 above. As per requirements of their discharge

permit, the Valencia Water Reclamation Plant has a monitoring station just upstream of the Project area. Monthly hardness values for the Santa Clara River at this station ranged from 326 to 360 mg/L as $CaCO_3$ in 2004. Other water quality comparisons to this station were not made due to lack of wet weather monitoring. The hardness value of 250 mg/L is a conservative estimate of wet-weather hardness values that should occur in the Project area, although higher values are likely to occur.

In this document, the CTR criteria are used as one type of benchmark to evaluate the potential ecological impacts of Project runoff on the receiving waters.

Table 3-1: 2002 CWA Section 303(d) Listings for the Santa Clara River Mainstem

SCR Reach or Tributary[1]	Geographic Description & Distance from Project to Upstream End of Reach	Pollutants	TMDL Priority	303(d) List Proposed TMDL Completion	Potential Sources	TMDL Status and Notes
7_E	Blue Cut Gaging Station to West Pier Hwy 99 (Project location)	1) Chloride 2) High coliform count 3) Nitrate and nitrite	1) High 2) Medium 3) Low	1) 2002 2) None listed 3) None listed	Nonpoint and point sources	The Regional Board has adopted a Nitrogen compound TMDL (including Ammonia) into the Basin Plan. The Regional Board has adopted a Chloride TMDL into the Basin Plan.
3_R	Freeman diversion dam to "A" street (25 miles)	1) Ammonia 2) Chloride 3) Total Dissolved Solids	1) High 2) High 3) Low	1) 2003 2) 2002 3) None listed	Nonpoint and point sources	The Regional Board has adopted a Nitrogen compound TMDL (including Ammonia) into the Basin Plan. The EPA promulgated Chloride TMDLs for Reach 3_R. The EPA recommended that the State defer implementation of the TMDL until after adoption of a proposed Basin Plan amendment of the chloride objective for Reach 3_R. The Regional Board has developed a tentative Basin Plan amendment to revise the Reach 3_R chloride objective from 80 to 100 mg/L. The EPA supports this increase in the water quality objective. The status of TMDL development for TDS is unknown.
--	Estuary (40 miles)	1) ChemA[2] 2) Coliform 3) Toxaphene	1) Medium 2) Medium 3) Medium	None listed	1) Unknown Source 2) Nonpoint source 3) Nonpoint source	Draft documents are available for the Total Maximum Daily Loads for Santa Clara River Estuary Beach/Surfers' Knoll, McGrath State Beach, and Mandalay Beach Coliform and Beach Closures (07/18/2003).

[1]SCR reaches upstream of the NRSP subregion have not been included.
[2]ChemA suite of chlorinated legacy pesticides include: aldrin, chlordane, dieldrin, endosulfan I/II, endrin, gamma-BHC, heptachlor, heptachlor epoxide, and toxaphene.

Table 3-2: TMDL Waste Load Allocations for MS4 and Stormwater Sources to Santa Clara River Reach 7_E

Impairing Pollutant	Numeric Water Quality Objective	Waste Load Allocation
Chloride (Resolution No. 03-008)	100 mg/L.	Waste load allocations have been adopted for the Saugus WRP and the Valencia WRP. Other NPDES discharges contribute a minor chloride load. The waste load allocation for these point sources is **100 mg/L**. The source analysis indicates that nonpoint sources are not a major source of chloride. The load allocations for nonpoint sources is **100 mg/L**.
Nitrogen Compounds (Resolution No. 03-011)	The numeric target for NO_3-N + NO_2-N in the Nitrogen Compounds TMDL was based on achieving the existing water quality objective of 5 mg/L NO_3-N + NO_2-N. The numeric target that was used to calculate the waste load allocations included a 10% margin of safety; thus the numeric target is 4.5 mg/L NO_3-N + NO_2-N (30-day average). The water quality objectives for ammonia in Reach 7_E used in the Nitrogen Compounds TMDL are: TMDL Ammonia Water Quality Objective (mg/L as N) 1-hr average / 30-day average Reach 7_E at County Line: 3.4 / 1.2 Reach 7_E below Valencia: 5.5 / 2.0 Reach 7_E above Valencia: 4.8 / 2.0	Concentration-based wasteloads are allocated to municipal, industrial, and construction stormwater sources regulated under NPDES permits. For stormwater permittees discharging into Reach 7_E, the following waste load allocations apply: **30-day average nitrate plus nitrite = 6.8 mg/L (NO_3-N + NO_2-N)** **1-hour average ammonia = 5.2 mg/L (NH_3 as N)** **30-day average ammonia = 1.75 mg/l (NH_3 as N)**

3.4 California Porter-Cologne Act

The federal CWA places the primary responsibly for the control of surface water pollution and for planning the development and use of water resources with the states, although it does establish certain guidelines for the states to follow in developing their programs and allows EPA to withdraw control from states with inadequate implementation mechanisms.

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act). The Porter-Cologne Act grants the State Water Resource Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) power to protect water quality and is the primary vehicle for implementation of California's responsibilities under the federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a water quality control plan (Basin Plan) for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its state water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

3.5 Basin Plan

The Basin Plan (LARWQCB, 1994, as amended) provides quantitative and narrative criteria for a range of water quality constituents applicable to certain receiving water bodies and groundwater basins within the Los Angeles Region. Specific criteria are provided for the larger, designated water bodies within the region, as well as general criteria or guidelines for ocean waters, bays and estuaries, inland surface waters, and ground waters. In general, the narrative criteria require that degradation of water quality does not occur due to increases in pollutant loads that will adversely impact the designated beneficial uses of a water body. For example, the Los Angeles Basin Plan requires that "Inland surface waters shall not contain suspended or settleable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors." Water quality criteria apply within receiving waters as opposed to applying directly to runoff; therefore, water quality criteria from the Basin Plan are utilized as benchmarks as one method to evaluate the potential ecological impacts of Project runoff on the receiving waters of the proposed Project. Table 2-2 above lists the beneficial uses of applicable receiving waters.

The Basin Plan also contains water quality criteria for groundwater basins. For example, the Basin Plan requires that "Ground waters shall not contain taste or odor producing substances in concentrations that cause nuisance or adversely affect beneficial uses."

3.6 MS4 Permit

In 2001, the Los Angeles Regional Water Quality Control Board (LARWQCB, 2001) issued an NPDES Permit and Waste Discharge Requirements (Order No. 01-182) under the CWA and the Porter-Cologne Act for discharges of urban runoff in public storm drains in Los Angeles County. The Permittees are the Los Angeles County cities and the County (collectively "the Co-permittees"). This permit regulates stormwater discharges from MS4s in the Project area. The NPDES permit details requirements for new development and significant redevelopment, including specific sizing criteria for treatment BMPs and flow control requirements.

To implement the requirements of the NPDES permit, the Co-permittees have developed development planning guidance and control measures that control and mitigate stormwater quality and quantity impacts to receiving waters as a result of new development and redevelopment. They are also required to implement other municipal source detection and elimination programs, as well as maintenance measures.

3.6.1 Stormwater Quality Management Program

The MS4 Permit contains the following provisions for implementation of the Stormwater Quality Management Program (SQMP) by the Co-permittees:

- General Requirements – Each permittee is required to implement the SQMP to comply with applicable storm water program requirements and implement additional controls where necessary to reduce the discharge of pollutants in stormwater to the maximum extent practicable (MEP).
- BMP Implementation – Permittees are required to implement the most effective combination of BMPs for stormwater/urban runoff pollution control.
- SQMP Revision – Permittees are required to revise the SQMP to comply with regional, watershed specific requirements, and/or waste load allocations for implementation of TMDLs for impaired waterbodies.
- Responsibilities of the Principal Permittee – The responsibilities of the Los Angeles County Department of Public Works (as the Principal Permittee) include, but are not limited to, coordinating activities necessary to comply with the NPDES permit, providing personnel and fiscal resources for SQMP updates and annual reports and summaries of reports required under the SQMP, and implementing a County-wide Monitoring Program and evaluating results of the monitoring program.

- Responsibilities of Permittees – Each permittee is required to comply with the requirements of the SQMP applicable to the discharges within its boundaries.
- Watershed Management Committees (WMCs) – WMCs are comprised of a voting representative from each Permittee within the Watershed Management Areas (WMAs). WMCs are required to facilitate efforts and exchange of information between Permittees, establish additional goals for WMAs, prioritize pollution control efforts, monitor implementation of tasks designated for the WMA, and assess the effectiveness of and recommend revisions to the SQMP.
- Legal Authority – Permittees are granted the necessary legal authority to prohibit non-storm water discharges to the storm drain system.

The objective of the SQMP is to reduce pollutants in urban stormwater discharges to the "maximum extent practicable" in order to attain water quality objectives and to protect the beneficial uses of receiving waters in Los Angeles County. Special provisions are provided in the MS4 permit to facilitate implementation of the SQMP. These provisions include:

- BMP substitution – Substitution of site-specific BMPs is allowed provided the alternative BMP will meet or exceed pollutant reduction of the original BMP, the fiscal burden of the original BMP is substantially greater than the proposed alternative, and the alternative BMP will be implemented within a similar time period.
- Public Information and Participation Program (PIPP) – This requires the permittee to identify how public education needs were determined, who is responsible for developing and implementing the program, and the method used to determine its effectiveness.
- Industrial/Commercial Facilities Control Program – This requires the permittee to develop a plan for managing stormwater runoff from industrial and commercial facilities. This program will track, inspect, and ensure compliance at industrial and commercial facilities that are sources of pollutants in storm water.
- Development Planning Program – This requires the permittee to implement a development-planning program that requires new development and redevelopment Projects to minimize impacts from stormwater and urban runoff.
- Development Construction Program – This requires the permittee to implement a program to control runoff from construction activity to minimize erosion and transportation of sediment and prevent non-stormwater discharges from equipment and vehicle washing.
- Public Agency Activities Program – This requires municipalities to evaluate existing public agency activities that have an impact on stormwater quality (such as vehicle maintenance, landscape maintenance and weed control, and construction and maintenance of streets, roads, and flood control systems) and to develop a program to reduce stormwater impacts with a schedule for implementation.

- Illicit Connections and Illicit Discharges Elimination Program – This requires each permittee to have a plan for finding and preventing illegal connections and discharges and a mechanism for enforcing against illegal connections and discharges.

3.6.2 Standard Urban Stormwater Mitigation Plan

On March 8, 2000, the development planning program requirements, including the Standard Urban Stormwater Mitigation Plan requirements (collectively, development planning program requirements, including Standard Urban Stormwater Mitigation Pan requirements, are referred to in this report as SUSMP requirements) were approved by the RWQCB as part of the MS4 program to address stormwater pollution from new construction and redevelopment. The SUSMP contains a list of minimum BMPs that must be employed to infiltrate or treat stormwater runoff, control peak flow discharge, and reduce the post-Project discharge of pollutants from stormwater conveyance systems. The SUSMP defines, based upon land use type, the types of practices that must be included and issues that must be addressed as appropriate to the development type and size. Compliance with SUSMP requirements is used as one method to evaluate significance of Project development impacts on surface water runoff.

Finalized in May 2000, the County of Los Angeles' "Manual for the Standard Urban Stormwater Mitigation Plan" details the requirements for new development and significant redevelopment BMPs (Los Angeles County, 2000) (the "Manual"). The Manual is a model guidance document for use by Permittees and individual Project owners to select post-construction BMPs and otherwise comply with the SUSMP requirements. It addresses water quality and drainage issues by specifying design standards for structural or treatment control BMPs that infiltrate or treat stormwater runoff and control peak flow discharge. BMPs are defined in the Manual and SUSMP requirements as any program, technology, process, sizing criteria, operational methods or measures, or engineered systems, which, when implemented, prevent, control, remove, or reduce pollution. Treatment BMP design criteria and guidance are also contained in the MS4 Permit, the Manual, and in the Technical Manual for Stormwater Best Management Practices in the County of Los Angeles, issued by the Department of Public Works in February 2004 (LACDPW, 2004).

One of the most important requirements within the SUSMP is the specific sizing criteria for stormwater treatment BMPs for new development and significant redevelopment Projects. The SUSMP includes sizing criteria for both volume-based and flow-based BMPs. The sizing criteria options for volume-based BMPs, such as extended detention basins, are as follows:

1. The 85th percentile 24-hour runoff event storm event determined as the maximized capture stormwater volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (WEF, 1998); or,

2. The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/Commercial (1993); or,

3. The volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a stormwater conveyance system; or,

4. The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County Area) that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile, 24-hour runoff event.

Volume-based treatment control BMPs for the Project will be sized to capture and treat 80 percent of the annual runoff volume, with a drawdown time of 48 hours. This methodology utilizes historical rainfall data with continuous simulation modeling to calculate the treatment volume for each treatment control BMP (see Appendix C for further detail) and is consistent with criteria 2 above. The size of the facilities will be finalized during the design stage by the Project engineer with the final hydrology study, which will be prepared and approved to ensure consistency with this analysis prior to issuance of a grading permit.

Flow-based BMPs, such as vegetated swales, must be designed to infiltrate or treat the maximum flow rate generated from one of the following scenarios:

1. The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity, or

2. The flow of runoff produced from a rain event equal to at least two times the 85th percentile hourly rainfall intensity for Los Angeles County, or

3. The flow of runoff produced from a rain event that will result in treatment of the same portion of runoff as treated using volumetric standards above.

Flow-based BMPs for the Project will be sized using a rainfall intensity of 0.3 inches per hour, which will result in treatment of the same portion of runoff as treated using volumetric standards above (criteria 3). BMP sizing for Landmark Village will be finalized during the design stage by the Project engineer with the final hydrology study, which will be prepared and approved to ensure consistency with this analysis prior to issuance of a grading permit.

Also, the SUSMP includes general design specifications for individual priority Project categories. These include:

- Single-Family Hillside Home
- 100,000 square foot commercial developments

- Restaurants
- Retail gasoline outlets
- Automotive repair shops
- Parking lots

For example, commercial developments must have properly designed loading and unloading dock areas, repair and maintenance bays, and vehicle equipment wash areas. Restaurants need to have properly designed equipment and accessory wash areas. Parking lots have to be properly designed to limit oil contamination and have regular maintenance of parking lot stormwater treatment systems (e.g., storm drain filters and biofilters).

The proposed Project is required to incorporate appropriate SUSMP requirements into Project plans as part of the development plan approval process for building and grading permits. This analysis will identify the general design specifications related to parking lots and other Project features associated with Landmark Village. Design of these BMPs will be finalized by the Project engineer with the hydrology study to ensure consistency with this analysis prior to issuance of the grading permit.

3.6.3 Hydromodification and Peak Flow Control

Part 4. Section D.1. of the MS4 Permit notes that increased volume, velocity, and discharge duration of stormwater runoff from developed areas may potentially accelerate downstream erosion and impair habitat-related beneficial uses in Natural Drainage Systems. As a result, Section D.1. of the Permit stipulates that Permittees shall control post-development peak storm water runoff discharge rates, velocities and durations in Natural Drainage Systems to prevent accelerated stream erosion and to protect stream habitat. Natural Drainage Systems are defined by the Permit to include the Santa Clara River.

Further, under Part 4, § D.1 of the MS4 Permit, the County and its co-permittees were required to develop and implement by February 1, 2005, numeric criteria for peak flow control in accordance with the findings of the Peak Discharge Impact Study analyzing the potential impacts on natural streams due to impervious development. The County of Los Angeles Department of Public Works and the Southern California Storm Water Monitoring Coalition have been conducting the study, but the study was not completed in time to meet the February 1st deadline. Therefore, on January 31, 2005, the County adopted and submitted to the LARWQCB an Interim Peak Flow Standard to be in effect until such time as a final standard can be adopted based on a completed study.

The adopted Los Angeles County Interim Peak Flow Standard was derived from a similar Interim Peak Flow Standard for Ventura County approved by the LARWQCB under the SUSMP requirements provisions of the MS4 Permit. The intent of the Interim Standard, as described by

the County in the cover letter dated January 31, 2005, signed by Donald L. Wolfe transmitting the Interim Standard to Jonathan Bishop of the LARWQB, is to provide protection for natural streams to the extent supported by findings from the ongoing study, and consistent with practical construction practices.

The Interim Peak Flow Standard adopted by the County is:

> *The Peak Flow Standard shall require that all postdevelopment runoff from a 2-year, 24-hour storm shall not exceed the predevelopment peak flow rate, burned, from a 2-year, 24-hour storm when the predevelopment peak flow rate equals or exceeds five cubic feet per second. Discharge flow rates shall be calculated using the County of Los Angeles Modified Rational Method. The Peak Flow Standard shall also require that postdevelopment runoff from the 50-year capital storm shall not exceed the predevelopment peak flow rate, burned and bulked, from the 50-year capital storm.*

In its cover letter dated January 31, 2005, signed by Donald L. Wolfe, transmitting the Peak Flow Interim Standard to Jonathan Bishop of the LARWQB, the County notes that upon completion of the Peak Discharge Impact Study, new peak flow standards may be determined to be appropriate.

The proposed Project is required to meet the peak flow control criteria as a part of the development plan approval process for building and grading permits. This analysis will identify the general facilities and design specifications necessary to comply with the current peak flow control criteria. Analysis of the peak flow control requirements in effect at the time that the hydrology study is prepared will be required, and peak flow requirements must be updated at that time. As a part of the hydrology study and prior to issuance of grading permit, the Project engineer must analyze and design the drainage facilities required to meet the peak flow control requirements then in effect under the MS4 Permit, and required to comply with this analysis.

3.7 Construction Permits

Pursuant to the CWA Section 402(p), requiring regulations for permitting of certain stormwater discharges, the State Water Resources Control Board (SWRCB) has issued a statewide general NPDES Permit and Waste Discharge Requirements for stormwater discharges from construction sites ((NPDES No. CAS000002) California Water Resources Control Board Resolution No. 2001-046; Modification of Water Quality Order 99-08-DWQ State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity (adopted by the SWRCB on April 26, 2001)).

Under this Construction General Permit, discharges of stormwater from construction sites with a disturbed area of one or more acres (effective March 2003) are required to either obtain individual NPDES permits for stormwater discharges or be covered by the Construction General

Permit. Coverage under the Construction General Permit is accomplished by completing and filing a Notice of Intent with the SWRCB. Each applicant under the Construction General Permit must ensure that a Stormwater Pollution Prevention Plan (SWPPP) is prepared prior to grading and implemented during construction. The primary objective of the SWPPP is to identify, construct, implement, and maintain BMPs to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the construction site during construction. Compliance with the requirements of the Construction General Permit is used as one method to evaluate Project construction-related impacts on surface water quality.

3.8 General Waste Discharge Requirements for Dischargers of Groundwater From Construction and Project Dewatering

The Los Angeles Regional Water Quality Control Board has issued a General NPDES Permit and General Waste Discharge Requirements (WDRs) (Order No. R4-2003-0111, NPDES No. CAG994004) governing construction-related dewatering discharges within the Project development areas (the "General Dewatering Permit.") This permit addresses discharges from temporary dewatering operations associated with construction and permanent dewatering operations associated with development. The discharge requirements include provisions mandating notification, sampling and analysis, and reporting of dewatering and testing-related discharges. The General Dewatering Permit authorizes such construction-related activities so long as all conditions of the permit are fulfilled. Compliance with the requirements of the General Dewatering Permit is used as one method to evaluate Project construction-related impacts on surface water quality.

3.9 Discharge of Fill or Dredge Materials

Hydrologic conditions of concern addressed in this report include instream changes in sediment transport, erosion, and sedimentation, and ultimately channel stability. There is a nexus between the these concerns and the stream, habitat, and species protection programs administered by the United States Army Corps of Engineers (ACOE), California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service.

Section 404 of the Clean Water Act is a program that regulates the discharge of dredged and fill material into waters of the United States, including wetlands. Activities in waters of the United States that are regulated under this program include fills for development, water resource Projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. EPA and the ACOE have issued Section 404(b)(1) Guidelines (40 CFR 230) that regulate dredge and fill activities, including water quality aspects of such activities. Subpart C at Sections 230.20 thru 230.25 contains water quality regulations applicable to dredge and fill activities. Among other topics, these guidelines address discharges which alter substrate elevation or contours, suspended particulates, water clarity, nutrients and chemical content, current patterns and water circulation, water fluctuations (including those that alter erosion or sediment rates), and salinity gradients.

Section 401 of the Clean Water Act requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. Subject to certain limitations, no license or permit may be issued by a federal agency until certification required by Section 401 has been granted. Further, no license or permit may be issued if certification has been denied. CWA Section 404 permits and authorizations are subject to section 401 certification by the Regional Water Quality Control Boards (RWQCBs).

This report does not analyze the habitat and wildlife impacts associated with physical alterations to waters of the United States proposed in conjunction with the project, such as dredge, fill, or bed, bank or channel improvements or stabilization measures affecting waters of the U.S. The impacts associated with these physical alterations are analyzed in detail in the biota and floodplain modification sections of the project EIR. As discussed in Section 4.4.2 below, this report does analyze the adverse impacts to natural drainage systems that may be caused by the project's alteration of hydrologic conditions.

3.10 Lake or Streambed Alteration Agreement (LSAA)

The CDFG is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the law requires the proponent of a Project that may impact a river, stream, or lake to notify the CDFG before beginning the Project. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation.

Section 1602 of the Fish and Game Code requires any person who proposes a Project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake or use materials from a streambed to notify the CDFG before beginning the Project. Similarly, under section 1602 of the Fish and Game Code, before any State or local governmental agency or public utility begins a construction Project that will: 1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; 2) use materials from a streambed; or 3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake, it must first notify the CDFG of the proposed Project. If the CDFG determines that the Project may adversely affect existing fish and wildlife resources, a Lake or Streambed Alteration Agreement is required.

This report does not analyze the habitat and wildlife impacts associated with physical alterations to waters of the United States proposed in conjunction with the project, such as dredge, fill, or bed, bank or channel improvements or stabilization measures affecting waters of the U.S. The

impacts associated with these physical alterations are analyzed in detail in the biota and floodplain modification sections of the project EIR. As discussed in Section 4.4.2 below, this report does analyze the adverse impacts to natural drainage systems that may be caused by the project's alteration of hydrologic conditions.

4 POLLUTANTS OF CONCERN AND SIGNIFICANCE CRITERIA

4.1 Surface Water Pollutants of Concern

4.1.1 Pollutants of Concern

Pollutants of concern consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at concentrations or loads considered potentially toxic to humans and/or flora and fauna. The pollutants of concern for the water quality analysis are those that are anticipated or potentially could be generated by the Project at concentrations, based on water quality data collected in Los Angeles County from land uses that are the same as those proposed by the Project, that exhibit these characteristics. Identification of the pollutants of concern for the Project considered proposed land uses, current 303(d) listings and TMDLs in the Santa Clara River, as well as pollutants that have the potential to cause toxicity or bioaccumulate in the Project's receiving waters. Appendix A lists the pollutants of concern, the basis for their selection, and the significance criteria that will be applied for each.

The following pollutants were chosen as pollutants of concern for purposes of evaluating water based upon the above considerations:

***Sediments (TSS and Turbidity)*:** Excessive erosion, transport, and deposition of sediment in surface waters are a significant form of pollution resulting in major water quality problems. Sediment imbalances impair waters' designated uses. Excessive sediment can impair aquatic life by filling interstitial spaces of spawning gravels, impairing fish food sources, filling rearing pools, and reducing beneficial habitat structure in stream channels. In addition, excessive sediment can cause taste and odor problems in drinking water supplies and block water intake structures.

***Nutrients (Phosphorus and Nitrogen (Nitrate+Nitrite-N and Ammonia-N))*:** Nutrients are inorganic forms of nitrogen (nitrate, nitrite and ammonia) and phosphorus. Organic forms of nitrogen are associated with vegetative matter such as particulates from sticks and leaves. Inorganic forms of nitrogen include nitrate, nitrite and ammonia. Total Nitrogen (TN) is a measure of all nitrogen present, including inorganic and particulate forms. There are several sources of nutrients in urban areas, mainly fertilizers in runoff from lawns, pet wastes, failing septic systems, and atmospheric deposition from industry and automobile emissions. Nutrient

over-enrichment is especially prevalent in agricultural areas where manure and fertilizer inputs to crops significantly contribute to nitrogen and phosphorus levels in streams and other receiving waters. Eutrophication due to excessive nutrient input can lead to changes in algae, benthic, and fish communities; extreme eutrophication can cause hypoxia or anoxia, resulting in fish kills. Surface algal scum, water discoloration, and the release of toxins from sediment can also occur.

Various downstream reaches of the Santa Clara River are identified as impaired by ammonia and nitrate- plus nitrite-nitrogen. Evidence of impairment includes low diversity of benthic macroinvertebrates and observations of excessive algae growth. A source analysis found that the majority of ammonia and nitrate/nitrite loads are from point sources; primarily water reclamation plants (WRPs) (LARWQCB, June 2003). Sources from municipal storm sewers are considered a minor source, but have a potential to cause significant local effects on water quality (LARWQCB, June 2003). TMDLs have been developed and adopted into the Basin Plan for nitrogen compounds, including nitrate/nitrite and ammonia.

Trace Metals (Copper, Lead, and Zinc)**:** The primary sources of trace metals in stormwater are typically commercially available metals used in transportation (e.g. automobiles), buildings, and infrastructure. Metals are also found in fuels, adhesives, paints, and other coatings. Copper, lead, and zinc are the most prevalent metals typically found in urban runoff. Other trace metals, such as cadmium, chromium, and mercury, are typically not detected in urban runoff or are detected at very low levels (LADPW, 2000). Metals are of concern because of the potential for toxic effects on aquatic life and the potential for ground water contamination. High metal concentrations can lead to bioaccumulation in fish and shellfish and affect beneficial uses of receiving waters.

Pathogens (Bacteria, Viruses, and Protozoa) – Elevated pathogens are typically caused by the transport of domestic animal, wildlife, or human fecal wastes from the watershed. Runoff that flows over land such as urban runoff can mobilize pathogens, including bacteria and viruses. Even runoff from natural areas can contain pathogens (e.g., from wildlife). Other sources of pathogens in urban areas include pets and leaky sanitary sewer pipes. The presence of pathogens in runoff can impair receiving waters and contaminate drinking water sources. Elevated pathogens are typically caused by the transport of animal or human fecal wastes from the watershed. Historically an indicator organism such as fecal coliform has been used for pathogens due to the difficulty of monitoring for pathogens directly. More recently, the scientific community has questioned the use of indicator organisms, as scientific studies have shown no correlation between indictor and pathogen levels and therefore total and fecal coliform may not indicate a significant potential for causing human illness (Paulsen and List, 2003). Santa Clara River Reach 7_E is identified as impaired by high fecal coliform counts from point and nonpoint sources. Coliform TMDLs have not yet been developed for this river reach.

Petroleum Hydrocarbons (Oil and Grease and PAHs)**:** The sources of oil, grease, and other petroleum hydrocarbons in urban areas include spillage fuels and lubricants, discharge of

domestic and industrial wastes, atmospheric deposition, and runoff. Runoff can be contaminated by leachate from asphalt roads, wearing of tires, and deposition from automobile exhaust. Also, do-it-yourself auto mechanics may dump used oil and other automobile-related fluids directly into storm drains. Petroleum hydrocarbons, such as polycyclic aromatic hydrocarbons (PAHs), can bioaccumulate in aquatic organisms from contaminated water, sediments, and food and are toxic to aquatic life at low concentrations. Hydrocarbons can persist in sediments for long periods of time and result in adverse impacts on the diversity and abundance of benthic communities. Hydrocarbons can be measured as total petroleum hydrocarbons (TPH), oil and grease, or as individual groups of hydrocarbons, such as PAHs.

***Pesticides*:** Pesticides (including herbicides, insecticides and fungicides) are chemical compounds commonly used to control insects, rodents, plant diseases, and weeds. Excessive application of a pesticide may result in runoff containing toxic levels of its active component. Pesticides may be classified as organochlorine pesticides or organophosphorus pesticides, the former being associated with persistent bioaccumulative pesticides (e.g., DDT and other legacy pesticides) which have been banned. The Santa Clara River estuary is listed as impaired for legacy pesticides. Organophosphorus pesticides include diazinon and chlorpyrifos whose uses also are being restricted by EPA.

***Trash & Debris*:** Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic debris (such as leaves, grass cuttings, and food waste) are general waste products on the landscape that can be entrained in urban runoff. The presence of trash & debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a water body and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

***Bioaccumulation*:** Certain pollutants, such as pesticides, selenium and mercury, have a tendency to bioaccumulate. The Basin Plan and the CTR criteria set forth toxicity objectives for receiving water levels of substances that bioaccumulate in aquatic resources to prohibit concentrations of toxic substances that are harmful to human health and adversely affect beneficial uses.

***Chloride*:** High levels of chloride in Santa Clara River Reaches 3_E, and 7_E are causing impairment of listed beneficial uses for agricultural irrigation. Irrigation of salt sensitive crops such as avocados and strawberries with water containing elevated levels of chloride potentially results in reduced crop yields. Chloride levels in some areas exceed water quality standards associated with groundwater recharge. Chloride TMDLs have been developed and adopted into the Basin Plan. The major sources of elevated chloride are dry-weather discharges from WRPs, contributing about 70% of the chloride load. Minor point sources are dewatering operations, and swimming pool and water ride discharges.

Methylene Blue Activated Substances (MBAS). MBAS are related to the presence of detergents in water. Positive results may indicate the presence of wastewater or be associated with urban runoff due to commercial and/or residential vehicle washing or other outdoor washing activities. Surfactants disturb the surface tension which affects insects and can affect gills in aquatic life.

4.1.2 Other Constituents

This section discusses other constituents that are listed in the Basin Plan, but for reasons explained below, are not pollutants of concern for the Project.

BOD (Biochemical Oxygen Demand) and Dissolved Oxygen. Adequate levels of dissolved oxygen are necessary to support aquatic life. High levels of oxygen demanding substances discharged to receiving waters can depress oxygen levels to levels of concern. Oxygen demanding substances are compounds that can be biologically degraded through aerobic processes. The presence of oxygen demanding substances can deplete oxygen supplies in waters and can contribute to algae growth. Nutrients in fertilizers and food wastes in trash are examples of likely oxygen demanding compounds to be present on the Project site. Other biodegradable organic materials include human and animal waste and vegetative matter. Biodegradable pollutants are largely subsumed by the nutrients and trash and debris categories above, and therefore will not be discussed as a separate category.

Chemical Constituents. Chemical constituents in excessive amounts in drinking water are harmful to human health. The Basin Plan objectives for chemical constituents states: "Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use." The chemical constituents referenced under this water quality objective, such as trace metals and nitrate are either subsumed by the categories above, or are not found in urban runoff (e.g., fluoride).

Temperature. Increase in temperature can result in lower dissolved oxygen levels, impairing habitat and other beneficial uses of receiving waters. Discharges of wastewater can also cause unnatural and/or rapid changes in temperature of receiving waters, which can adversely affect aquatic life. Elevated temperatures are typically associated with discharges of process wastewaters or non-contact cooling waters. As the beneficial uses in the receiving waters for the Project include warm freshwater habitat to support warm water ecosystems, temperatures of stormwater runoff from the Project are not of concern.

Total Residual Chlorine. Total residual chlorine can be present in wastewater treatment plant discharges, or may be present in dry weather urban runoff from the emptying of swimming pools that have not been de-chlorinated. Chlorine is a strong oxidant and is therefore very toxic to aquatic life. Municipal pools and private pools in areas served by a municipal sanitary system are required to be discharged into the sanitary system, and therefore, total residual chlorine will not be present in runoff from the Project.

Color, Taste, and Odor. The Basin Plan contains narrative objectives for color, taste, or odor that causes a nuisance or adversely affects beneficial uses. Undesirable tastes and odors in water may be a nuisance and may indicate the presence of a pollutant(s). Odor associated with water can result from decomposition of organic matter or the reduction of inorganic compounds, such as sulfate. Other potential sources of odor causing substances, such as industrial processes, will not occur as part of the Project. Color in water may arise naturally, such as from minerals, plant matter, or algae, or may be caused by industrial pollutants. The Project will contain no industrial uses. Therefore, color-, taste-, or odor-producing substances are not pollutants of concern for the Project.

Exotic Vegetation. Non-native (exotic) vegetation typically provides little habitat value and can out compete native vegetation that is more suitable habitat for aquatic and terrestrial organisms. The Basin Plan objective for exotic vegetation states: "Exotic vegetation shall not be introduced around stream courses to the extent that such growth causes nuisance or adversely affects designated beneficial uses." The potential for non-native plan species to impact natural drainages is analyzed in the Landmark Village Biota Report (Impact Sciences, 2005).

Mineral Quality: TDS, Sulfate, Boron, and SAR. Mineral quality in natural waters is largely determined by the mineral assemblage of soils and rocks near the land surface. Elevated mineral concentrations could impact beneficial uses; however, the minerals listed in the Basin Plan, except chloride and nitrogen, are not believed to be constituents of concern due to the absence of river impairments and/or, as with TDS, anticipated post-development runoff concentrations well below the Basin Plan objectives (Table 4-1). Therefore, these constituents are not considered pollutants of concern for the Project.

Table 4-1: Comparison of Mineral Basin Plan Objectives with Mean Measured Values in LA County

Mineral	Los Angeles Basin Plan Water Quality Objective for SCR Reach 7_E (mg/L)	Mean Concentration in Single-Family Residential Runoff[1] (mg/L)
Total Dissolved Solids	1000	58
Sulfate	400	7
Boron	1.5	0.2
Sodium Absorption Ratio[2]	10	3.0

[1]Source: Los Angeles County, 2000
[2]Sodium adsorption ratio (SAR) predicts the degree to which irrigation water tends to enter into cation-exchange reactions in soil.

pH. The hydrogen ion activity of water (pH) is measured on a logarithmic scale, ranging from 0 to 14. While the pH of "pure" water at 25 ºC is 7.0, the pH of natural waters is usually slightly

basic due to the solubility of carbon dioxide from the atmosphere. Aquatic organisms can be highly sensitive to pH. The Basin Plan objective for pH is:

> "the pH of inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0.5 units from natural conditions as a result of waste discharge."

Mean runoff concentrations in the Los Angeles County stormwater monitoring data ranged from 6.5 for mixed- and single-family residential land uses to 7.0 for commercial land use. Therefore, pH in the Santa Clara River is not expected to be affected by runoff discharges from the Project.

PCBs. PCBs are highly toxic persistent chemicals that have been historically released into the environment from industrial uses, such as transformers, but are no longer produced in the United States. Due to their persistence, PCBs can still be detected in urban runoff due to historic industrial sources of these chemicals. The Project area did not historically include PCB-producing land uses. Therefore, PCBs are not a pollutant of concern for the Project.

Radioactive substances. Radioactive substances typically occur at very low concentrations in natural waters. Some activities such as mining or certain industrial activities (e.g., energy production, fuel reprocessing) can increase the amount of radioactive substances impairing beneficial uses. The Project will not have industrial or other activities that would be a source of any radioactive substances, and development will stabilize any naturally radioactive soils, though unlikely to be present in the Project area. Therefore, radioactive substances are not a pollutant of concern for the Project.

Toxicity. Certain pollutants in stormwater runoff have the potential to be highly toxic to aquatic organisms resulting in effects such as impaired reproduction or mortality. The Basin Plan water quality objective for toxicity is:

> "All surface waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life."

Toxicity in urban runoff could be caused by ammonia, trace metals, PAHs, or pesticides. These constituents are subsumed by the pollutant of concern categories above.

4.2 Groundwater Pollutants of Concern

The Project will allow for incidental infiltration of urban runoff to groundwater after receiving treatment in the Project PDFs, as well as infiltration of irrigation water. Research conducted on the effects on groundwater from stormwater infiltration by Pitt et al. (1994) indicate that the

potential for contamination is dependent on a number of factors including the local hydrogeology and the chemical characteristics of the pollutants of concern.

Chemical characteristics that influence the potential for groundwater impacts include high mobility (low absorption potential), high solubility fractions, and abundance in stormwater. As a class of constituents, trace metals tend to adsorb onto soil particles and are filtered out by the soils. This has been confirmed by extensive data collected beneath stormwater detention/retention ponds in Fresno (conducted as part of the Nationwide Urban Runoff Program) that showed that trace metals tended to be adsorbed in the upper few feet in the bottom sediments. Bacteria are also filtered out by soils. More mobile constituents such as chloride and nitrate would have a greater potential for infiltration.

4.2.1 Pollutants of Concern

The pollutants of concern for the groundwater quality analysis are those that are anticipated or potentially could be generated by the Project at concentrations, based on water quality data collected in Los Angeles County from land uses that are the same as those proposed by the Project, that exhibit these characteristics. Identification of the pollutants of concern for the Project considered proposed land uses as well as pollutants that have the potential to impair beneficial uses of the groundwaters below the Project. The Los Angeles Basin Plan contains numerical objectives for bacteria, mineral quality, nitrogen, and various toxic chemical compounds, and contains qualitative objectives for taste and odor.

Nitrate+Nitrite-N was chosen as the pollutant of concern for purposes of evaluating groundwater quality impacts based upon the above considerations. High nitrate levels in drinking water can cause health problems in humans. Infants can develop methemoglobinemia (blue-baby syndrome). Human activities and land use practices can influence nitrogen concentrations in groundwaters. For example, irrigation water containing fertilizers can increase levels of nitrogen in groundwater.

4.2.2 Other Constituents

Bacteria: The Basin Plan contains numeric criteria for bacteria in drinking water sources. As bacteria are removed through straining in soils (for example, as with septic tank discharges), incidental infiltration of runoff in the Project treatment PDFs is not expected to affect bacteria levels in groundwater.

Chemical Constituents and Radioactivity: Drinking water limits for inorganic and organic chemicals that can be toxic to human health in excessive amounts and radionuclides are contained in Title 22 of the California Code of Regulations. These chemicals and radionuclides are not expected to occur in the Project's runoff.

Taste and Odor. The Basin Plan contains a narrative objective for taste and odor that cause a nuisance or adversely affect beneficial uses. Undesirable tastes and odors in groundwater may be a nuisance and may indicate the presence of a pollutant(s). Odor associated with water can result from natural processes, such as the decomposition of organic matter or the reduction of inorganic compounds, such as sulfate. Other potential sources of odor causing substances, such as industrial processes, will not occur as part of the Project. Therefore, taste and odor-producing substances are not pollutants of concern for the Project.

Mineral Quality: TDS, Sulfate, Chloride, and Boron. Mineral quality in groundwaters is largely influenced by the mineral assemblage of soils and rocks that it comes into contact with. Elevated mineral concentrations could impact beneficial uses; however, the minerals listed in the Basin Plan are not believed to be pollutants of concern due to the anticipated runoff concentrations and the typical mineral concentrations in irrigation water (Castaic Lake Water Agency), which are well below the Basin Plan objectives (Table 4-2). Therefore, these constituents are not considered pollutants of concern for the Project.

Table 4-2: Comparison of Basin Plan Mineral Groundwater Objectives with Mean Measured Values in LA County and SWP Water Quality at Castaic Lake

Mineral	Los Angeles Basin Plan Groundwater Quality Objective[1] (mg/L)	Mean Concentration in Single-Family Residential Runoff[2] (mg/L)	Typical Concentration in Castaic Lake Water Agency Water[3](mg/L)
Total Dissolved Solids	700	58	314
Sulfate	250	7	52
Chloride	100	0.2	81
Boron	1.0	0.57	0.2

[1]Santa Clara-Bouquet and San Francisquito Canyons subbasin
[2]Source: Los Angeles County, 2000
[3]Source: The Santa Clarita Valley 2003 Annual Water Quality Report (available at www.clwa.org/h20quality/pdfs)

4.3 Hydrologic Conditions of Concern (Hydromodification)

Urbanization modifies natural watershed and stream hydrologic and geomorphic processes by introducing impervious surfaces and drainage infrastructure into a watershed (SCCWRP, 2005; GeoSyntec, 2002; Bledsoe & Watson, 2001; Booth, 1990; Hollis, 1975; Hammer, 1972). Potential changes to the hydrologic regime may include increased runoff volumes, frequency of runoff events, long-term cumulative duration, as well as increased peak flows. Urbanization may also introduce dry weather flows where only wet weather flows existed prior to development. These changes are referred to as "hydromodification."

Hydromodification intensifies sediment transport and often leads to stream channel enlargement and loss of habitat and associated riparian species (SCCWRP, 2005; GeoSyntec, 2002; Bledsoe & Watson, 2001; MacRae, 1992; Booth, 1990). Under certain circumstances, development can

also cause a reduction in the amount of sediment supplied to the stream system, which can lead to stream channel incision and widening. These changes also have the potential to impact downstream channels and habitat integrity. A Project that increases runoff due to impervious surfaces and traps sediment from upland watershed sources creates compounding effects.

A change to the Project site's hydrologic regime would be considered a condition of concern if the change could have a significant impact on downstream natural channels and habitat integrity, alone or in conjunction with impacts of other Projects.

4.4 Significance Criteria and Thresholds for Significance

4.4.1 Water Quality Significance Thresholds

Appendix A provides the criteria for evaluating the significance of a potential impact for each pollutant of concern. These criteria and the threshold for significance can be summarized as follows. The application of the criteria to a decision regarding significance requires an integrated or "weight of evidence" approach, rather than a decision based on any one of the individual criterion.

Thresholds of significance for water quality impacts have been developed based on a review of the MS4 Permit and the CEQA Guidelines, Appendix G. Significant adverse water quality impacts are presumed to occur if the proposed Project would:

- Create sizeable additional sources of polluted runoff to receiving waters that would result in exceedances of receiving water quality or substantially degrade water quality in receiving waters.
- Create sizeable additional sources of polluted runoff that would violate any water quality standards or waste discharge requirements for surface water runoff.
- Create sizeable additional sources of polluted construction site runoff (including polluted discharges associated with construction activities such as materials delivery, staging or storage, vehicle or equipment fueling, vehicle or equipment maintenance, waste handling, or hazardous materials handling or storage) that would violate any water quality standards or waste discharge requirements for surface water runoff or groundwater discharge.

This report analyzes whether sizeable additional sources of polluted runoff may result from the Project based on the results of water quality modeling and qualitative assessments that take into account water quality controls or BMPs that are considered Project Design Features (PDFs). Any increases in pollutant concentrations or loads resulting from the development of the Project site are considered an indication of a potentially significant adverse water quality impact. If loads and concentrations resulting from development are predicted to stay the same or to be

reduced when compared with existing conditions, it is concluded that the Project will not cause a significant adverse impact to the ambient water quality of the receiving waters for that pollutant.

If pollutant loads or concentrations are expected to increase, then for both the post-development and construction phases, potential impacts are assessed by evaluating compliance of the Project, including PDFs, with requirements of the MS4 Permit, including SQMP and SUSMP requirements, the General Construction Permit, and the General Dewatering Permit. Further, post-development increases in pollutant loads and concentrations are evaluated by comparing the magnitude of the increase to relevant benchmarks, including receiving water TMDLs and receiving water quality objectives and criteria from the Basin Plan and CTR, as described below.

Receiving Water Benchmarks. Comparison of post-development water quality concentrations in the runoff discharge with benchmark TMDL waste load or load allocations for MS4 discharges establishes the likelihood that runoff would result in TMDL exceedances in receiving waters or would otherwise degrade receiving water quality.

Comparison of post-development water quality concentrations in the runoff discharge with benchmark numeric and narrative receiving water quality criteria as provided in the Basin Plan and the CTR facilitates analysis of the potential for runoff to result in exceedances of receiving water quality standards, adversely affect beneficial uses, or otherwise degrade receiving waters.

Water quality criteria are considered benchmarks for comparison purposes only, as such criteria apply within receiving waters as opposed to applying directly to runoff discharges. Narrative and numeric water quality objectives contained in the Basin Plan apply to the Project's receiving waters. Water quality criteria contained in the CTR provide concentrations that are not to be exceeded in receiving waters more than once in a three year period for those waters designated with aquatic life or human health related uses. Projections of runoff water quality are compared to the acute form of the CTR criteria (as discussed above), as stormwater runoff is associated with episodic events of limited duration, whereas chronic criteria apply to 4-day exposures which do not describe typical storm events in the Project area, which last seven hours on average. If pollutant levels in stormwater runoff do not exceed receiving water benchmarks, it is one indication that no significant impacts will result from Project development.

MS4 Permit Requirements for New Development (SUSMP). Satisfaction of MS4 Permit requirements for new development, including SUSMP requirements and SQMP requirements, and satisfaction of construction-related requirements of the General Construction Permit and General Dewatering Permit establish compliance with water quality regulatory requirements applicable to stormwater runoff.

The MS4 Permit requires that the SQMP specify BMPs that will be implemented to reduce the discharge of pollutants in stormwater to the Maximum Extent Practicable. MS4 requirements are met when new development complies with the SUSMP requirements set forth in the MS4

Permit. Under the SUSMP requirements, the effectiveness of stormwater treatment controls are primarily based on two factors - the amount of runoff that is captured by the controls and the selection of BMPs to address identified pollutants of concern. Selection and numerical sizing criteria for new development treatment controls are included in the MS4 Permit and the County SUSMP Manuals. If the Project PDFs meet these criteria, and other source control and site design BMPs consistent with the SUSMP requirements are implemented, it indicates that no significant impacts will occur as the result of insufficient capacity for stormwater treatment.

Construction General Permit and General Dewatering Permit. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) that describes erosion and sediment control BMPs as well as material management/ non-stormwater BMPs that will be used during the construction phase of development. The General Dewatering Permit addresses discharges from permanent or temporary dewatering operations associated with construction and development and includes provisions mandating notification, sampling and analysis, and reporting of dewatering and testing-related discharges. To evaluate significance of construction phase Project water quality impacts, we evaluate whether water quality control is achieved by implementation of BMPs consistent with Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology (BAT/BCT), as required by the Construction General Permit and the General Dewatering Permit.

4.4.2 Significance Thresholds for Hydrologic Conditions of Concern (Hydromodification Impacts)

Thresholds of significance for evaluating hydrologic impacts and conditions of concern have been developed based on a review of the MS4 Permit and the CEQA Guidelines, Appendix G. Significant adverse impacts to natural drainage systems created by altered hydrologic conditions of concern are presumed to occur if the proposed Project would:

- Substantially alter the existing drainage pattern of a natural drainage, stream, or river in a manner that would cause substantial erosion, siltation, or channel instability; or
- Substantially increase the rates, velocities, frequencies, duration and/or seasonality of flows in a manner that causes channel instability or in a manner that harms sensitive habitats or species in natural drainages.

4.4.3 Cumulative Impacts

CEQA requires the analysis of cumulative impacts of a Project when the Project's incremental effects may be significant when assessed along with the effects of past Projects and the effects of other current Projects, and the reasonably foreseeable effects of probable future Projects. The discussion of cumulative impacts must reflect the potential severity of the impacts and their likelihood of occurrence, but the discussion and analysis need not provide as great a detail as is

provided for the direct effects attributable to the Project alone. This report therefore analyzes the potential for cumulative water quality impacts, cumulative groundwater quality impacts and cumulative hydrologic impacts generally in accordance with the thresholds for direct impacts discussed in Sections 4.4.1 and 4.4.2 above, and section 4.4.4 below. See Sections 7.7, 7.8, and 7.9 below for this analysis.

The cumulative analysis of all surface water quality and hydrologic impacts in this report is based primarily on "adopted projections" found in the Los Angeles County Department of Public Works adopted and approved Hydrology Manual, which have been verified by reference to approved plans, including the City of Santa Clarita and County of Los Angeles adopted General Plans, as well as available empirical data for the Santa Clara River. As required by CEQA, the focus of the cumulative impacts analysis for this Project will be on the Project's incremental contribution to significant adverse water quality and hydrologic impacts to the SCR, taking into account the reasonably foreseeable water quality and hydrologic impacts of other Projects that may develop impervious surfaces and urban land uses within the watershed in accordance with adopted general plans and related projections. The cumulative impacts analysis will consider the Project's incremental contribution to significant cumulative water quality and hydrologic impacts to the SCR in light of the water quality and hydrology impact mitigation achieved by the PDFs. The analysis will also consider whether the Project, including PDFs, and future Projects will comply with specific requirements in a previously approved ordinance, plan, or mitigation program (such as the Basin Plan, the CTR, the MS4 Permit, the General Construction Permit and the General Dewatering Permit) that have been adopted for the purpose of avoiding or substantially lessening the cumulative water quality and hydrologic impact problems within the geographic area in which the Project is located.

4.4.4 Groundwater Quality Impacts

Thresholds of significance for evaluating the hydrologic and water quality impacts of the Project on groundwater have been developed based on CEQA Appendix G thresholds. Significant adverse impacts to groundwater are presumed to occur if the proposed Project would:

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge so as to cause a net deficit in aquifer volume or a lowering of the local groundwater table.
- Through changes in surface water runoff quality and quantity (including Project treatment PDFs), and changes in groundwater recharge, result in a violation of any groundwater quality standards or waste discharge requirements or otherwise substantially degrade water quality.

Groundwater quality is addressed in Section 7.8.1. Groundwater quality benchmarks were compared with post-development runoff water quality to establish the likelihood that runoff would result in a degradation of groundwater quality. Groundwater recharge is addressed in

Section 7.8.2. The hydrologic effects of the Project on groundwater were examined by comparison of historical and present levels of the underlying aquifer to determine the impact of development on aquifer volume.

5 PROJECT DESIGN FEATURES

Project Design Features (PDFs) for water quality and hydrologic impacts include site design, source control, treatment control, and hydromodification control BMPs that will be incorporated into the Project and are considered a part of the Project for impact analysis. Effective management of wet and dry weather runoff water quality begins with limiting increases in runoff pollutants and flows at the source. Site design and source control BMPs are practices designed to minimize runoff and the introduction of pollutants in stormwater runoff. Treatment control BMPs are designed to remove pollutants once they have been mobilized by rainfall and runoff. Hydromodification control BMPs are designed to control increases in post-development runoff flows. This section describes the site design, source control, treatment control, and hydromodification control PDFs for the Project.

5.1 SUSMP Requirements and Project Design Features

Table 5-1 summarizes the SUSMP requirements and the corresponding proposed PDFs.

Table 5-1: SUSMP Requirements and Corresponding Project Design Features

SUSMP Requirement	Criteria/ Description	Corresponding Landmark Village PDFs
1. Peak Flow Controls	• Control post-development peak discharge rates, velocities and duration in Natural Drainage Systems to prevent accelerated downstream erosion and to protect habitat related beneficial uses.[2] • All post-development runoff from a 2-year, 24-hour storm shall not exceed the predevelopment peak flow rate, burned, from a 2-year, 24-hour storm when the predevelopment peak flow rate equals or exceeds five cfs. Discharge flow rates shall be calculated using the County of Los Angeles Modified Rational Method. • Postdevelopment runoff from the 50-year capital storm shall not exceed the predevelopment peak flow rate, burned and bulked, from the 50-year capital storm. • Control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.	• Hydromodification source control BMPs will include bioretention and vegetated swales. • Underground detention pipes will be provided to match the peak flow from the 2-year, 24-hour storm event. • 50-year capital storm peak flow rate analysis is contained in the "Landmark Village Tentative Tract Map 53108 Drainage Concept", prepared by Psomas (Psomas, 2005)

[2] This requirement is from Part 4, § D.1 of the MS4 Permit.

SUSMP Requirement	Criteria/ Description	Corresponding Landmark Village PDFs
2. Conserve Natural Areas	• Concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition • Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection • Maximize trees and other vegetation at each site, planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants • Promote natural vegetation by using parking lot islands and other landscaped areas • Preserve riparian areas and wetlands	• The NRSP clusters development into villages, including Landmark Village. Approximately 70% (8,335 acres) of the NRSP will remain undeveloped. • Approximately 55 acres of the 288 acre Landmark Village Project area will remain as open space or parks. • Existing site land use is agriculture, so little or no native vegetation is found in pre-development conditions. • Native and/or climate-appropriate vegetation will be utilized within the development. • The final Project stormwater system will include the use of the vegetated treatment BMPs, including bioretention (placed in median strips and parking lot islands (where applicable)) and vegetated swales. • Riparian buffers will be preserved along the Santa Clara River corridor by clustering development upland and away from the river.
3. Minimize Stormwater Pollutants of Concern	• Minimize, to the maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts generated from site runoff of directly connected impervious areas (DCIA) to the stormwater conveyance system as approved by the building official.	• Treatment control BMPs will be selected to address the pollutants of concern for the Project (see Section 5.2 below). These BMPs are designed to minimize introduction of pollutants to the Maximum Extent Practicable (MEP). • The Project will include numerous source controls, including education programs, animal waste bag stations, street sweeping and catch basin cleaning, an Integrated Pest Management (IPM) Program per the LAUSD standards for common area landscaping in commercial and multi-family residential areas, use of native and/or non-invasive vegetation, installation of a car wash pad in multi-family residential areas, and directing runoff to vegetated areas. • An education program will be implemented that includes both the education of residents and commercial businesses regarding water quality issues. Topics will include services that could affect water quality, such as carpet cleaners and others that may not properly dispose of cleaning wastes; community car washes; and residential car washing. The education program will emphasize animal waste management, such as the importance of cleaning up after pets and not feeding pigeons, seagulls, ducks, and geese. • Vegetated treatment control BMPs will allow for stormwater infiltration as well as pollutant

SUSMP Requirement	Criteria/ Description	Corresponding Landmark Village PDFs
		removal.
4. Protect Slopes and Channels	Project plans must include BMPs consistent with local codes and ordinances and the SUSMP requirements to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff: • Convey runoff safely from the tops of slopes and stabilize disturbed slopes • Utilize natural drainage systems to the maximum extent practicable • Control or reduce or eliminate flow to natural drainage systems to the maximum extent practicable • Stabilize permanent channel crossings • Vegetate slopes with native or drought tolerant vegetation • Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game.	• There are no significant slopes or natural drainage channels within the developed portion of the Project in the post-developed condition. • Natural slopes and native vegetation on slopes to the SCR will be preserved and/or restored and enhanced. • Project PDFs, including swales, bioretention areas, and water quality basins (hydrologic source controls), will reduce flows to natural channels through infiltration and evapotranspiration. • The banks of the Santa Clara River at portions of this site will be stabilized using buried bank stabilization. After the implementation of these measures and other flow control and volume reduction PDFs, the Santa Clara River will be capable of handling the expected flow regime with little or no erosion. For a detailed description of bank stabilization see Section 2.3.3. • Native vegetation will be used in all plant palettes placed on restored slopes. • All outlet points to the Santa Clara River will include energy dissipaters per the NRHMP. For a detailed description of energy dissipation see Section 2.3.2.
5. Provide Storm Drain System Stenciling and Signage	• All storm drain inlets and catch basins within the Project area must be stenciled with prohibitive language and/or graphical icons to discourage illegal dumping. • Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the Project area. • Legibility of stencils and signs must be maintained.	• All storm drain inlets and water quality inlets will be stenciled or labeled. • Signs will be posted in areas where dumping could occur. • The HOA will maintain stencils and signs.
6. Properly Design Outdoor Material Storage Areas	• Where proposed Project plans include outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system measures to mitigate impacts must be included.	• Pesticides, fertilizers, paints, and other hazardous materials used for maintenance of common areas, parks, commercial areas, and multifamily residential common areas will be kept in enclosed storage areas.

SUSMP Requirement	Criteria/ Description	Corresponding Landmark Village PDFs
7. Properly Design Trash Storage Areas	All trash containers must meet the following structural or treatment control BMP requirements: • Trash container areas must have drainage from adjoining roofs and pavement diverter around the areas. • Trash container areas must be screened or walled to prevent offsite transport of trash.	• All trash facilities will be covered and isolated from stormwater runoff.
8. Provide Proof of Ongoing BMP Maintenance	• Applicant required to provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, and/or Conditional Use Permits.	• The Home Owners Association or a Landscape Maintenance District will be responsible for operations and maintenance of swale and bioretention BMPs. • Los Angeles County Department of Public Works will be responsible for maintaining extended detention basins.
9. Design Standards for Structural or Treatment Control BMPs	• Post-construction Structural or Treatment Control BMPs shall be designed to mitigate (infiltrate or treat) stormwater runoff using either volumetric treatment control BMPs or flow-based treatment control BMPs sized per listed criteria (see section 3.6.2 above).	• Stormwater treatment facilities will be designed to meet or exceed the sizing standards in the LA County SUSMP requirements. • Volume-based treatment control BMPs for the Project will be designed to capture 80 percent or more of the annual runoff volume per criteria 2 of the MS4 Permit. See Appendix C for further detail. • Flow-based BMPs will be sized using criteria 3, which will provide 80 percent capture of annual runoff volume per criteria of the MS4 Permit. See Appendix C for further detail. • The size of the facilities will be finalized during the design stage by the Project engineer with the final hydrology study, which will be prepared and approved to ensure consistency with this analysis prior to issuance of a final grading permit. • The structural BMPs in the stormwater treatment system will be configured to achieve treatment in multiple BMP facilities for the majority of the developed areas. This "treatment train" approach affects greater pollutant removal. • Types of treatment control BMPs that will be employed include vegetated swales, bioretention, and dry extended detention basins, and a combination thereof.

SUSMP Requirement	Criteria/ Description	Corresponding Landmark Village PDFs
10.B.1 Properly Design Loading/ Unloading Dock Areas (100,000 ft^2 Commercial Developments)	• Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater • Direct connections to storm drains from depressed loading docks (truck wells) are prohibited	• Loading dock areas will be covered or designed to preclude run-on and runoff. • Direct connections to storm drains from depressed loading docks (truck wells) will be prohibited. • Below grade loading docks for fresh food items will drain through a Treatment Control BMP applicable to the use, such as a catch basin insert. • Loading docks will be kept in a clean and orderly condition through weekly sweeping and litter control, at a minimum and immediate cleanup of spills and broken containers without the use of water.
10B.2. Properly Design Repair/ Maintenance Bays (100,000 ft^2 Commercial Developments)	• Repair/ maintenance bays must be indoors or designed in such a way that does not allow stormwater run-on or contact with stormwater runoff. • Design a repair/maintenance bay drainage system to capture all wash water, leaks, and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/ maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.	• Commercial areas will not have repair/maintenance bays or the bays will comply with design requirements.
10B.3. Properly Design Vehicle/ Equipment Wash Areas (100,000 ft^2 Commercial Developments)	• Self-contained and /or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.	• Areas for washing/steam cleaning of vehicles will be self-contained or covered with a roof or overhang; will be equipped with a wash racks and with the prior approval of the sewering agency; will be equipped with a clarifier or other pretreatment facility: and will be properly connected to a sanitary sewer.
10.D. Properly design fueling area (Retail Gasoline Outlets)	• The fuel dispensing area must be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. • The fuel dispensing area must be paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited. • The fuel dispensing areas must have a 2% to 4% slope to prevent ponding,	• Retail gasoline outlets will comply with design requirements.

SUSMP Requirement	Criteria/ Description	Corresponding Landmark Village PDFs
	and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff. • At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.	
10.E.1. Properly design fueling area (Automotive Repair Shops)	• See requirement 10.D. above.	• Automotive repair shop fueling areas will comply with design requirements.
10.E.2. Properly design repair/ maintenance bays (Automotive Repair Shops)	• See requirement 10.B.2 above.	• Automotive repair shop repair/maintenance bays will comply with design requirements.
10.E.3. Properly design vehicle/equipment wash areas (Automotive Repair Shops)	• Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.	• Automotive repair shop vehicle/equipment wash areas will comply with design requirements.
10.E.4. Properly design loading/unloading dock areas (Automotive Repair Shops)	• See requirement 10.B.1. above.	• Automotive repair shop loading/unloading dock areas will comply with design requirements.
10.F.1. Properly Design Parking Area (Parking Lots)	• Reduce impervious land coverage of parking areas • Infiltrate runoff before it reaches the storm drain system • Treat runoff before it reaches storm drain system	• Commercial and multi-family parking lots will incorporate bioretention facilities located in islands to promote filtration and infiltration of runoff. • Stormwater runoff from parking lots will be directed to treatment control BMPs, including swales, water quality basins and/or bioretention areas, in compliance with SUSMP requirements.
10.F.2 Properly Design to Limit Oil Contamination and Perform Maintenance (Parking Lots)	• Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used. • Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal	• See above. • Treatment of runoff in bioretention (or vegetated swales) and catch basin inserts will be used to address oil and petroleum hydrocarbons from high-use parking lots. • Maintenance will be performed by either the HOA or as set forth in the BMP maintenance responsibilities program.

SUSMP Requirement	Criteria/ Description	Corresponding Landmark Village PDFs
13. Limitation of Use of Infiltration BMPs	• Infiltration is limited based on design of BMP, pollutant characteristics, land use, soil conditions, and traffic. • Appropriate conditions (groundwater >10 ft from grade) must exist to utilize infiltration to treat and reduce stormwater runoff for the Project.	• Bioretention and vegetated swales are not considered infiltration BMPS; they allow for infiltration of fully-treated runoff only.

5.2 Treatment BMPs

The SUSMP requirements mandate that treatment controls address the pollutants of concern, which are defined in the SUSMP Manual as consisting of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at concentrations or loads considered potentially toxic to humans and/or flora and fauna. These parameters were considered in defining pollutants of concern for analysis. See Section 4.1 of this report. Pollutants of Concern for the Project include:

- Sediments (TSS and Turbidity)
- Nutrients (Phosphorus, Nitrate-N + Nitrite-N, and Ammonia-N)
- Trace Metals (Copper, Lead, and Zinc)
- Pathogens (Bacteria, Viruses, and Protozoa)
- Petroleum Hydrocarbons (Oil and Grease and PAHs)
- Pesticides
- Trash & Debris
- Chloride
- Methylene Blue Activated Substances (MBAS)

Treatment BMPs to be used for the Project are listed in Table 5-2, along with the pollutants of concern addressed by each.

Table 5-2: Treatment Control BMP Selection Matrix

Pollutant of Concern[1]	Treatment Control BMP Categories		
	Vegetated Swale	Bioretention	Extended Detention Basins
Sediment	M	H	M
Nutrients	L	M	L
Trash	L	H	H
Trace Metals	M	H	M
Bacteria	L	H	M
Organics[2]	M	H	M

Source: California Stormwater Best Management Practices Handbook for New Development and Redevelopment (CASQA, 2003)
Note: H, M, L, indicates high, medium, and low removal efficiency.
[1]Chloride and MBAS are addressed with source control BMPs, as they are not treatable in typical stormwater treatment BMPs, aside through incidental infiltration.
[2]Includes pesticides and petroleum hydrocarbons.

As currently planned, stormwater runoff from all urban areas within the Project will be routed to bioretention areas, vegetated swales, and/or extended detention basin treatment control BMPs (Figure 5-1). Catch basin inserts will also be used in high use parking lots. Collectively, the water quality treatment control PDFs will treat the pollutants of concern in runoff from the approximately 288 acre development area. The off-site SR-126 expansion Project will provide vegetated swale treatment for both the new and existing untreated roadway area. The extended detention basin, vegetated swales, and bioretention areas will be designed to operate off-line, receiving dry weather flows, small storm flows, and the initial portion of large storm flows from a low-flow diversion structure in the storm drain. The proposed treatment control PDFs are illustrated in Figure 5-1, are summarized in Table 5-3, and are described below. These treatment BMPs, when combined with the site design and source control BMPs described above, will address all of the pollutants of concern. The effectiveness of the selected treatment BMPs is described in detail in Appendix B, Section B.2.5. The effectiveness of treatment BMPs is evaluated without taking site design and source control BMPs into account. Therefore, the analysis is conservative in that it understates water quality controls.

Design criteria for the treatment control BMPs, including sizing, are presented in Appendix C.

Bioretention: Bioretention areas are vegetated (i.e., landscaped) shallow depressions that provide storage, infiltration, and evapotranspiration, and also provide for pollutant removal (e.g. filtration, adsorption, nutrient uptake) by filtering stormwater through the vegetation and soils. In bioretention areas, as well as in vegetated swales, pore spaces and organic material in the soils help to retain water in the form of soil moisture and to promote the adsorption of pollutants (e.g., dissolved metals and petroleum hydrocarbons) into the soil matrix. Plants utilize soil moisture and promote the drying of the soil through transpiration. Due to the highly infiltrative soils on

the Project site, no underdrain will be required for the biofiltration areas. Treated flows will be fully infiltrated. A conceptual illustration of a biofiltration area is shown in Figure 5-2, and photographs of existing bioretention areas are provided in Figure 5-3.

Vegetated Swales: Vegetated swales are engineered, vegetation-lined channels that provide water quality treatment in addition to conveying stormwater runoff. Swales provide pollutant removal through settling and filtration in the vegetation (often grasses) lining the channels and also provide the opportunity for volume reduction through infiltration and evapotranspiration. Swales are most effective where longitudinal slopes are small (2 percent to 6 percent), thereby increasing the residence time for treatment, and where water depths are less than the vegetation height. A conceptual illustration of a vegetated swale is shown in Figure 5-4 and photographs of existing swales are provided in Figure 5-5. Check dams can be incorporated into a vegetated swale design to promote enhanced settling and infiltration through velocity reduction and ponding. The Project will incorporate vegetated swales with check dams wherever velocities or slopes are too high for vegetated swales alone. A conceptual illustration of a vegetated swale with check dams is shown in Figure 5-6.

Extended Detention Basins: The water quality basin will incorporate dry extended detention to provide water quality treatment for storm flows. Dry extended detention basins are designed with outlets that detain the runoff volume from the water quality design storm for some minimum time (in this case 48 hours) to allow particulates and associated pollutants (phosphorous, trace metals, some pesticides, and other pollutants) to settle out. The water quality basin will also incorporate wetland vegetation in a low-flow channel in the bottom of the basin for the treatment of dry weather flows and small storm events. Wetland vegetation provides one of the most effective methods for pollutant removal. As runoff flows through the wetland vegetation, pollutant removal is achieved through settling and biological uptake of nutrients and dissolved pollutants within the wetland. These basins are not designed or anticipated to contain ponded, standing water for periods in excess of 36 to 48 hours. A conceptual illustration of an extended detention basin is shown in Figure 5-7 and photographs of existing basins are provided in Figure 5-8.

Table 5-3: Project Drainage Areas and Treatment Control BMPs

Drainage Area	Area (acres)	Selected Treatment BMP(s) and Location[1]
RVE-8A	22.8	Bioretention within RVE-8A
RVE-9A	5.7	Bioretention within RVE-9A
RVE-11B	16.2	Swale in RVE-12C
RVE-12C	1.2	Swale BMP area
RVE-13C	16.5	Swale in RVE-16D
RVE-16D	2.1	Swale BMP area
RVE-17D	18.0	Swale in RVE-21F
RVE-20E	18.3	Swale in RVE24F & Bioretention in islands
RVE-21F	0.7	Swale BMP area

Drainage Area	Area (acres)	Selected Treatment BMP(s) and Location[1]
RVE-24F	1.5	Swale BMP area
RVE-25F	14.4	Swale in RVE-29G
RVE-27B	7.3	Swale in RVE-29B
RVE-28B	5.0	Swale in RVE-29B
RVE-29B	1.1	Swale BMP area
RVC-2A	10.9	Bioretention in RVC-12C
RVC-3A	11.9	Bioretention in RVC-12C
RVC-7A	10.2	Bioretention in RVC-12C
RVC-8A	5.1	Bioretention in RVC-12C
RVC-11B	16.4	Swale in RVC-17C
RVC-12C	3.4	Bioretention BMP area
RVC-13C	1.5	Swale BMP area
RVC-17C	2.1	Swale BMP area
RVC-18C	17.4	Swale in RVC-21D
RVC-21D	2.6	Water quality basin and swale BMP area
RVC-22D	2.5	Water quality basin in RVC-21D
RVC-23E	39.3	Water quality basin in RVC-21D and treatment train (TBD in final design)
RVC-24E	7.4	Swale in RVC-21D
RVW-1A	10.8	Swale within sub-basin RVW-2A
RVW-2A	14.7	Swale within sub-basin RVW-2A
Project Total	287	

[1] Swale BMP areas are either vegetated swales or vegetated swales with check dams which will be determined by slope of BMP location.

Table 5-4: Off-site Project Feature - State Route 126 Drainage Areas and Treatment

Development Condition	Total Area (acres)	Treatment BMPs
Existing	31.6	none
Developed	31.6	Vegetated Swales

5.3 Hydromodification Control PDFs

Several hydrologic source controls are included as hydromodification control PDFs:

- *Treatment Controls*. The Project's treatment control BMPs will also serve as hydromodification control BMPs. Vegetated swales and extended detention basins can provide volume reduction on the order of 20 to 30 percent through infiltration and evaporation. The Project also includes use of bioretention areas sized to capture and treat 80 percent of the average annual stormwater runoff from its tributary catchment and will not utilize underdrains. Thus, all water captured in these facilities will be effectively removed from the Project's stormwater discharges. Collectively these vegetated

treatment facilities are expected to provide significant reduction in wet weather runoff. In addition these facilities will also receive and eliminate dry weather flows.

- *Site Design Practices.* Site design PDFs that help to reduce the increase in runoff volume include routing of roof runoff to vegetated areas, use of native and drought tolerate plants in landscaped areas, and the use of efficient irrigation systems in common area landscaped areas.
- *Peak Flow Control.* The current Los Angeles County Interim Peak Flow Standard requires that all post development runoff from a 2-year, 24-hour storm not exceed the predevelopment peak flow rate, burned, from a 2-year, 24-hour storm when the predevelopment peak flow rate equals or exceeds five cfs. Peak flow control of 2-year, 24-hour storm event will be achieved through appropriate sizing of the extended detention basin and through runoff volume reduction occurring in the vegetated swales and bioretention areas. Additional storage will be provided via detention in oversized pipes if required . The design and size of the detention pond and pipes and bioretention areas will be finalized during the design stage by the Project engineer as part of the final hydrology study, which will be review and approved by the County of Los Angeles to ensure consistency with the EIR analysis prior to issuance of a final grading permit.
- *Energy Dissipation*. Erosion protection in areas where discharges have the potential to cause stream erosion. Erosion protection will be provided at all storm drain outlets to the Santa Clara River.
- *Bank Stabilization*. The Project will include buried soil cement along the Santa Clara River and Castaic Creek adjacent to and downstream of the Project site. In total, approximately 17,700 linear feet (LF) of bank would be provided with buried soil cement protection. This would include approximately 10,900 feet fronting the Project site and approximately 6,800 LF on the south bank adjacent to the Long Canyon Road Bridge.

  Most of the proposed bank protection would consist of buried soil cement to provide scour and freeboard flood control protection. Soil cement is a modern flood control technique used to protect against erosion while maintaining natural vegetation and soft banks. Soil cement will be buried below the existing banks of the Santa Clara River. Disturbed areas will then re-vegetated with native plant species, maintaining the natural habitat presently found along the River.

  Bank stability protection along the Newhall Ranch SR-126/River utility corridor would be provided by installing approximately 4,700 LF of turf reinforcement mats (TRMs) along the north bank of the River from the western end of the Project to the easterly end of the previously approved Newhall Ranch Water Reclamation Plant. TRMs are designed to reinforce vegetation at the root and stem allowing vegetation to be used as erosion control in areas where flow conditions exceed the ability of natural vegetation to

remain rooted. This includes applications with high slopes or stream banks where grouted rip-rap and concrete channels are aesthetically undesirable.

- *Project Conditions*. To assure that it complies with any new peak or other design flow standards that may be adopted in the future, the Project will be conditioned to require, as a design feature, sizing and design of the hydraulic features (i.e., oversized pipes) as necessary to control the post-development runoff rates as necessary to meet numeric flow criteria that may be adopted from time to time by the Los Angeles County Department of Public Works under Part 4, § D.1 of the MS4 Permit.

6 WATER QUALITY MODELING APPROACH

6.1 Model Description

A water quality model was used to estimate pollutant loads and concentrations for certain pollutants of concern for pre-development conditions, post-development conditions, and post-development conditions with PDFs for the tentative map portion of the Project. The model is one of the few models that takes into account the observed variability in stormwater hydrology and water quality. This is accomplished by characterizing the probability distribution of observed rainfall event depths, the probability distribution of event mean concentrations, and the probability distribution of the number of storm events per year. These distributions are then sampled randomly using a Monte Carlo Approach to develop estimates of mean annual loads and concentrations.

A detailed description of the water quality model is presented in Appendix B. The following summarizes major features of the water quality model:

- *Rainfall Data*: The water quality model estimates the volume of runoff from storm events. The storm events were determined from 32 years (1969 - 2002) of hourly rainfall data measured at the National Climatic Data Center (NCDC) Newhall rain gage that incorporates a wide range of storm events. The rainfall analysis that is incorporated in the water quality model requires rainfall measurements at 1 hour intervals and a long period of record that is at least 20 to 30 years in length.

- *Land Use Runoff Water Quality*: The water quality model estimates the concentration of pollutants in runoff from storm events based on existing and proposed land uses. The pollutant concentrations for various land uses, in the form of Event Mean Concentrations (EMCs), were estimated from data collected in Los Angeles County. The Los Angeles County database was chosen for use in the model because: (1) it is an extensive database that is quite comprehensive, (2) it contains monitoring data from land use specific drainage areas, and (3) the data is representative of the semi-arid conditions in southern California.

- *Pollutant Load*: The pollutant load associated with each storm is estimated as the product of the storm event runoff times the event mean concentration. For each year in the simulation, the individual storm event loads are summed to estimate the annual load. The mean annual load is then the average of all the annual loads.

- *PDFs Modeled*: The modeling only considers certain structural treatment PDFs and does not take into account the source control PDFs (e.g., street sweeping) or certain treatment BMPs (e.g., catch basin inserts) which also would improve water quality. In this respect, the modeling results are conservative, i.e., tend to overestimate pollutant loads and concentrations.

- *Treatment Effectiveness*: The water quality model estimates mean pollutant concentrations and loads in stormwater following treatment. The amount of stormwater runoff that is captured by the treatment BMPs was calculated for each storm event, taking into consideration the intensity of rainfall, duration of the storm, and duration between storm events. The mean effluent water quality for treatment BMPs was based on the International Stormwater BMP Database (ASCE/EPA, 2004). The International Stormwater BMP Database was used because it is a robust, peer reviewed database that contains a wide range of BMP effectiveness studies that are reflective of diverse land uses. An analysis of the monitored inflow and outflow data contained in the International Stormwater BMP Database showed a volume reduction on the order of 38 percent for biofilters. Based on this analysis, a conservative estimate of 25 percent of the Project's inflow to the vegetated swales was assumed to infiltrate and/or evapotranspire in the water quality model. The bioretention areas will be designed to infiltrate 100% of inflow captures, but were conservatively modeled as infiltrating 90 percent of inflows. The extended detention basin was assumed to remove 10 percent of volume due to evapotranspiration, assuming no infiltration due to basin lining. If basins do not need to be lined, the volume reduction from these BMPs would be much greater. These conservative estimates are used for water quality modeling. Peak flow controls do not account for volume reductions by Project PDFs. These assumptions regarding volumetric losses were also used to assess the quantity of dry weather flows that would be captured in the treatment BMPs (see Section 7.8.2).

- *Bypass Flows*: The water quality model takes into account conditions when the treatment facility is full and flows are bypassed. Treatment PDFs that are considered in the model include bioretention areas, vegetated swales, and an extended detention basin. Bioretention results in a low predicted average annual pollutant load due to the runoff volume reduction through infiltration of 90 percent of treated flows. The predicted post-developed runoff concentrations from these areas are greater than runoff treated in vegetated swales because the concentrations represent mostly the untreated bypass flows, while the treated flows are mostly infiltrated. Vegetated swale and extended detention basin treatment allows for less runoff volume reduction, but will provide a lower

predicted average annual pollutant concentration due to the higher percentage of treated runoff in combination with untreated bypassed flows. The combination of these Project PDFs will provide effective reduction of both pollutant load and concentration.

- *Representativeness to Local Conditions*: The water quality model utilizes runoff water quality data obtained from tributary areas that have a predominant land use, and as measured prior to discharge into a receiving water body. Currently such data are available from stormwater programs in LA County, San Diego County, and Ventura County, although the amount of data available from San Diego County and Ventura County is small in comparison with the LA County database. Such data is often referred to as "end-of-pipe" data to distinguish it from data obtained in urban streams, for example.

6.2 Pollutants Modeled

The appropriate form of data used to address water quality are flow composite storm event samples, which are measures of the average water quality during the event. To obtain such data usually requires automatic samplers that collect data at a frequency that is proportionate to flow rate. The pollutants for which there are sufficient flow composite sampling data in the Los Angeles County database are:

- Total Suspended Solids (sediment)
- Total Phosphorus
- Nitrate-Nitrogen, Nitrite-Nitrogen, Ammonia, and Total Nitrogen (TN)
- Dissolved Copper
- Total Lead
- Dissolved Zinc
- Chloride

The other pollutants of concern, such as pathogens, hydrocarbons, pesticides, and trash and debris, are not amenable to this type of sampling either because of short holding times (e.g., pathogens), difficulties in obtaining a representative sample (e.g., hydrocarbons), or low detection levels (e.g., pesticides). These pollutants were addressed qualitatively using literature information and best professional judgment due to the lack of statistically reliable monitoring data for these pollutants (see Section 6.3 below).

6.3 Pollutants Addressed Without Modeling

The following pollutants of concern were addressed based on literature information and professional judgment because available data were not deemed sufficient for modeling:

- Turbidity
- Pathogens (Bacteria, Viruses, and Protozoa)
- Hydrocarbons (Oil and Grease, Polycyclic Aromatic Hydrocarbons)
- Pesticides
- Trash and Debris
- Methylene Blue Activated Substances (MBAS)

Human pathogens are usually not directly measured in stormwater monitoring programs because of the difficulty and expense involved; rather, indicator bacteria such as fecal coliform or certain strains of *E. Coli* are measured. Unfortunately, these indicators are not very reliable measures of the presence of pathogens in stormwater, in part because stormwater tends to mobilize pollutants from many sources, some of which contain non-pathogenic bacteria. For this reason, and because holding times for bacterial samples are necessarily short, most stormwater programs do not collect flow-weighted composite samples that potentially could produce more reliable statistical estimates of concentrations. Fecal coliform or *E. Coli* are typically measured with grab samples, making it difficult to develop reliable EMCs. Total coliform and fecal bacteria (fecal coliforms, fecal streptococcus, and fecal enterococcus) were detected in stormwater samples tested in Los Angeles County at highly variable densities (or most probable number, MPN) ranging between several hundred to several million cells per 100 ml (LADPW, 2000).

Hydrocarbons are difficult to measure because of laboratory interference effects and sample collection issues (hydrocarbons tend to coat sample bottles). Hydrocarbons are typically measured with single grab samples, making it difficult to develop reliable EMCs.

Pesticides in urban runoff are often at concentrations that are below detection limits for most commercial laboratories and therefore there are limited statistically reliable data available on pesticides in urban runoff. Pesticides were not detected in Los Angeles County monitoring data for land use-based samples, except for diazinon and glyphosate which were detected in less than 15 percent and 7 percent of samples, respectively (LADPW, 2000).

Trash and debris and MBAS sampling is not typically included in routine stormwater monitoring programs. Several studies conducted in the Los Angeles River basin have attempted to quantify trash generated from discrete areas, but the data represent relatively small areas or relatively short periods, or both. MBAS was included in the land use-based monitoring data, but not enough data is available for modeling purposes.

7 IMPACT ASSESSMENT

In this section, model results for each pollutant are evaluated in relation to the following significance criteria: (1) comparison of post-development versus pre-development stormwater quality concentrations and loads; (2) comparison with MS4 Permit, General Construction Permit,

and General Dewatering Permit requirements for new development; and (3) evaluation in light of receiving water benchmarks. Pursuant to the third criterion, predicted runoff pollutant concentrations in the post-development with PDFs condition are compared with benchmark receiving water quality criteria as provided in the Basin Plan and the CTR and TMDL waste load allocations. The water quality criteria and waste load allocations are considered benchmarks for comparison purposes only, since they do not apply directly to runoff from the Project, but the comparison provides useful information to evaluate potential impacts. A weight of evidence approach is employed in this analysis considering the various significance criteria.

The modeled pollutant impact assessment is presented in Section 7.1 and the quantitative analyses of the remaining pollutants of concern follow in Section 7.2. Analyses of dry weather impacts and compliance with NPDES Permit requirements and construction-related requirements of the Construction General Permit and Dewatering General Permit follow the pollutant-by-pollutant impact assessment. Also included is a discussion of other considerations, including operation and maintenance, vector control, bioaccumulation, and hydrologic impacts. The analysis of cumulative impacts to surface water, groundwater, and hydromodification is also provided.

7.1 Impact Assessment for Modeled Pollutants of Concern

Results from the water quality model for significance criteria 1 are reported in a series of tables, organized by constituent, showing predicted mean annual pollutant loads (lbs/yr) and mean annual concentrations. Projections are made for two conditions: (1) existing condition, and (2) developed condition with Project design features (PDFs).

Note that the modeling results account for pollutant reductions in the bioretention areas and vegetated swales only and do not account for the pollutant reductions that will occur due to source control PDFs and parking lot catch basin inserts. Because not all BMPs are modeled, the model results predict greater water quality impacts than are likely to occur from the Project.

Following the tables comparing post-development and pre-development water quality loads and concentrations for each constituent (except runoff volume) is a table comparing the post-development with PDFs runoff quality to the benchmark water quality objectives and criteria and TMDL waste load allocations for downstream reaches of the Santa Clara River. Water quality observed in the Santa Clara River is also included on these tables to provide comparison to the modeled developed condition with PDFs runoff quality.

The area of the Project included in the model was limited to the developed portion of the Project. As no impervious surfaces will be added in the borrow areas and the utility corridor and therefore there will be no change in runoff volume or pollutant loads and concentrations in the post-developed condition, these areas were not included in the model, but are included in the qualitative construction impact assessment.

7.1.1 Stormwater Runoff Volume

Table 7-1 shows the predicted changes in stormwater runoff mean annual volumes. Mean annual runoff volumes are expected to increase substantially with development. The increase can be explained by the change in percent imperviousness associated with urbanization and the highly infiltrative nature of the Project site's soils. For modeling purposes, the existing site was assumed to have an imperviousness of 15 percent to account for compaction by machinery and soil saturation due to irrigation. In contrast, single family residential land use is assumed to have an imperviousness of 42 percent and multi-family residential land uses is assumed to have an imperviousness of 68 percent. Runoff volume is directly proportional to percent imperviousness.

Project PDFs include site design, source control, and treatment control BMPs in compliance with the SUSMP requirements. The treatment control BMPs will allow for runoff volume reduction. Based on BMP monitoring data in the International Stormwater BMP Database, a 25 percent reduction in stormwater runoff volume was assumed to occur in the vegetated swales PDFs. Bioretention areas will be designed for 100 percent reduction of the water quality volume, but were modeled with a 90 percent volume reduction to produce conservative estimates. Water quality basins were modeled with a 10 percent volume reduction.

Table 7-1: Predicted Average Annual Stormwater Runoff Volumes

Site Conditions	Average Annual Stormwater Runoff Volume (acre-ft)
Existing	94
Developed with PDFs	236
Change	142

7.1.2 TSS

Comparison of Pre- and Post-Project Conditions: Table 7-2 shows the predicted average annual TSS concentration and loads. Conversion from the predominately pre-development agricultural land use to the post-development urban land use (with treatment) will reduce the average TSS concentration and loads in stormwater runoff from the Project site.

Table 7-2: Predicted Average Annual TSS Concentration and Load

Site Conditions	Average Annual TSS Concentration (mg/L)	Average Annual TSS Load (tons/yr)
Existing	812	104
Developed with PDFs	44	14
Change	-768	-90

Comparison with Water Quality Criteria: The predicted average annual TSS concentration in stormwater runoff from the total modeled area with PDFs is compared to water quality criteria and the range of observed concentrations in the Santa Clara River in Table 7-3. Predicted TSS load and concentration declines with development and is below the range of observed concentrations in Santa Clara River Reach 7_E. Based on the comprehensive site design, source control, and treatment control strategy, and the comparison with available in-stream data and basin plan benchmark objectives, the TSS in stormwater runoff from the Project will not cause a nuisance or adversely affect beneficial uses in the receiving waters.

Table 7-3: Comparison of Predicted TSS Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 7_E

Predicted Average Annual TSS Concentration (mg/L)	LA Basin Plan Water Quality Objectives	California Toxics Rule Criteria	Range of Observed[1] Concentrations in Santa Clara River Reach 7_E (mg/L)
44	Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses	NA	107 – 51,200

[1]Range of concentrations observed in the Santa Clara River during wet weather at USGS Station 11108500 (located approximately 3 miles downstream of the Project).
NA – not applicable

7.1.3 Total Phosphorus

Comparison of Pre- and Post-Project Conditions: Table 7-4 shows the predicted average total phosphorus (TP) concentration and annual loads. TP concentration and load are predicted to decrease post-development. The decrease in TP concentration and load can be attributed to higher total phosphorous EMCs observed in monitoring data from agricultural land uses versus urbanized land uses.

Table 7-4: Predicted Average Annual Total Phosphorus Concentration and Annual Load

Site Conditions	Average Annual TP Concentration (mg/L)	Average Annual TP Load (lbs/yr)
Existing	2.5	634
Developed with PDFs	0.3	164
Change	-2.2	-470

Comparison with Water Quality Criteria: There are no numeric objectives for TP in the LA Basin Plan. A narrative objective for biostimulatory substances in the LA Basin Plan states: "waters shall not contain biostimulatory substances in concentrations that promote algal growth

to the extent that such growth causes nuisance or adversely affects beneficial uses." The low predicted TP concentrations in Project stormwater discharges will not promote (i.e., increase) algae growth and therefore comply with the narrative objective for biostimulatory substances in the LA County Basin Plan. As shown in Table 7-5, the predicted total phosphorus concentration is at the low end of the range of observed concentrations in Santa Clara River Reach 7_E.

Table 7-5: Comparison of Predicted Total Phosphorus Concentration with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 7_E

Predicted Average Annual Total Phosphorus Concentration (mg/L)	LA Basin Plan Water Quality Objectives	California Toxics Rule Criteria	Range of Observed[1] Concentrations in Santa Clara River Reaches 7_E (mg/L)
0.3	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses	NA	0.3 – 12

[1]Range of concentrations observed in the Santa Clara River during wet weather at USGS Station 11108500 (located approximately 3 miles downstream of the Project).
NA – not applicable

Based on the comprehensive site design, source control, and treatment control strategy and the comparison with available in-stream monitoring data and Basin Plan benchmark objectives, potential impacts associated with total phosphorus are predicted to be less than significant.

7.1.4 Nitrogen Compounds

Comparison of Pre- and Post-Project Conditions: The predicted average nitrate-nitrogen plus nitrite-nitrogen and ammonia concentrations and annual loads are summarized in Table 7-6 and Table 7-7, respectively. Average concentrations and loads of nitrate-nitrogen plus nitrite nitrogen and ammonia-nitrogen are predicted to decrease. The decrease in nitrogen loads and concentrations can be attributed to higher nitrite-, nitrate-, and ammonia-nitrogen EMCs observed in monitoring data from agricultural land uses versus urbanized land uses.

Table 7-6: Predicted Average Annual Nitrate-N + Nitrite-N Concentration and Load

Site Conditions	Average Annual NO3-N+NO2-N Concentration (mg/L)	Average Annual NO3-N+NO2-N Load (lbs/yr)
Existing	11	2,870
Developed with PDFs	0.5	312
Change	-10	-2,558

Table 7-7: Predicted Average Annual Ammonia-N Concentration and Load

Site Conditions	Average Annual NH3 Concentration (mg/L)	Average Annual NH3 Load (lbs/yr)
Existing	1.5	384
Developed with PDFs	0.2	111
Change	-1.3	-273

Comparison with Water Quality Criteria: Predicted nitrogen compound concentrations are compared to Basin Plan objectives and observed concentrations in Table 7-8. Average annual stormwater concentration of ammonia is predicted to be considerably less than the waste load allocation for Santa Clara River Reach 7_E and the Basin Plan objective, and within the low end of the range of observed concentrations. Likewise, the average annual stormwater concentration of nitrate-N plus nitrite-N is predicted to be considerably less than the TMDL waste load allocation or the Basin Plan water quality objective and below the range of observed concentrations for this reach of the Santa Clara River.

Table 7-8: Comparison of Predicted Nitrogen Compound Concentrations with Water Quality Objectives, TMDLs, and Observed Concentrations in Santa Clara River Reach 7_E

Nutrient	Predicted Average Annual Concentration (mg/L)	TMDL Water Quality Objectives (mg/L)	TMDL Waste Load Allocation for Santa Clara River Reach 7_E (mg/L)	Range of Observed[1] Concentrations in Santa Clara River Reach 7_E (mg/L)
Nitrate-N + Nitrite-N	0.5	5	6.8[2]	0.78 – 5.8
Ammonia-N	0.2	2.0[2]	1.75[3]	0.1 – 6.4

[1]Range of concentrations observed in the Santa Clara River during wet weather at USGS Station 11108500 (located approximately 3 miles downstream of the Project).
[2] 30-day average Ammonia-N in Reach 7_E below Valencia.
[3]30-day average concentration.

Based on the comprehensive site design, source control, and treatment control strategy, and the comparison with available in-stream monitoring data and benchmark Basin Plan objectives and waste load allocations, potential impacts associated with nitrogen compounds are predicted to be less than significant.

7.1.5 Metals

Comparison of Pre- and Post-Project Conditions: Projected loads and concentrations for the trace metals copper, lead, and zinc are presented in through Tables 7-9 through 7-11. Where possible, the Projections are for the dissolved form of the metal, as it is the dissolved form to which the CTR criteria apply. However, due to consistently low concentrations of dissolved lead

in the available stormwater runoff data, it was not possible to develop reliable EMC parameters for most land uses for modeling the dissolved fraction of lead. This constituent was therefore modeled as the total recoverable metal. Copper, lead, and zinc are the most prevalent metals typically found in urban runoff. Other trace metals, such as cadmium, chromium, and mercury, are typically not detected in urban runoff or are detected at very low levels (LA County, 2000).

Post-development dissolved copper and zinc loads are Projected to increase compared to pre-development conditions; while dissolved copper concentration, total lead load and concentration, and dissolved zinc concentration will decrease. These results can be explained by the difference in EMC values observed in representative monitoring data from the pre-developed agriculture condition and the post-developed urban condition (see Appendix B, Table B-12). Runoff volumes will increase with development and the change in land use will decrease the runoff concentrations for all three trace metals for most proposed land uses.

Project PDFs include site design, source control, and treatment control BMPs in compliance with the SUSMP requirements. Specific site design PDFs that will be implemented to minimize increases in trace metals include directing drainage from impervious areas to bioretention areas and the selection of building material for roof gutters and downspouts that do not include copper or zinc. Source control PDFs that target metals include education for property owners, BMP maintenance, and street sweeping private streets and parking lots. The treatment control BMPs will also reduce trace metals in the runoff from the proposed development. Only the effects of the treatment control PDFs are reflected in the model results. Thus, increases in copper and zinc loads are overstated.

Table 7-9: Predicted Average Annual Dissolved Copper Concentration and Load

Site Conditions	Average Annual Dis. Cu Concentration (µg/L)	Average Annual Dis. Cu Load (lbs/yr)
Existing	22	5.6
Developed with PDFs	9.1	5.9
Change	-13	0.3

Table 7-10: Predicted Average Total Lead Concentration and Annual Load

Site Conditions	Average Annual Tot. Pb Concentration (µg/L)	Average Annual Tot. Pb Load (lbs/yr)
Existing	23	5.9
Developed with PDFs	4.9	3.2
Change	-18	-2.7

Table 7-11: Predicted Average Annual Dissolved Zinc Concentration and Load

Site Conditions	Average Annual Dis. Zn Concentration (µg/L)	Average Annual Dis. Zn Load (lbs/yr)
Existing	71	18
Developed with PDFs	56	36
Change	-15	18

Comparison with Water Quality Criteria: A narrative objective for toxic substances in the LA Basin Plan states: "all waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life."

The CTR criteria are the applicable water quality objectives for protection of aquatic life. The CTR criteria are expressed for acute and chronic (4-day average) conditions; however, only acute conditions were considered to be applicable for stormwater discharges because the duration of stormwater discharge is consistently less than 4 days. The CTR criteria are calculated on the basis of the hardness of the receiving waters. Lower hardness concentrations result in lower, more stringent CTR criteria. The minimum hardness value (280 mg/L as $CaCO_3$) observed in the Santa Clara River at the USGS monitoring site at Bouquet Junction during wet weather was used as a conservative estimate; the mean observed hardness value was 310 mg/L as $CaCO_3$.

Comparison of the estimated runoff concentrations and the acute CTR criteria are shown in Table 7-12. Although the dissolved copper and zinc loadings are predicted to increase, the comparison of the post-developed with PDFs condition to the benchmark CTR values shows that all of the trace metal concentrations are well below the water quality criteria (Table 7-12). Predicted trace metal concentrations are slightly above the range of observed concentrations for copper and zinc at the LADPW monitoring station upstream of the Project, but these observed values are probably somewhat lower than typical based on the large storm events that were monitored (see discussion in Section 2.4.2).

Table 7-12: Comparison of Predicted Trace Metal Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 7_E

Metal	Predicted Average Annual Concentration (µg/L)	California Toxics Rule Criteria[1] (µg/L)	Range of Observed[2] Concentrations in Santa Clara River Reach 9_E (µg/L)
Dissolved Copper (µg/L)	9.1	32	3.8 – 8.4
Total Lead (µg/L)	4.9	260	1.1 – 14.5
Dissolved Zinc (µg/L)	56	250	27 – 37

[1] Hardness = 250 mg/L, based on minimum observed value at USGS Station 11108500. Lead criteria is for total recoverable lead.
[2]Range of concentrations observed in the Santa Clara River during wet weather at LADPW Station S29 (located approximately 3 miles upstream of the Project).

Based on the comprehensive site design, source control, and treatment strategy and the comparison with the instream water quality monitoring data and benchmark CTR values, the Project will not have significant impacts resulting from trace metals.

7.1.6 Chloride

Comparison of Pre- and Post-Project Conditions: Table 7-13 shows the predicted average annual chloride concentration and load. Due to the conversion from agricultural to urban land-uses and the associated EMCs, annual chloride concentration and load is predicted to decrease when compared to the existing conditions.

Table 7-13: Predicted Average Annual Chloride Concentration and Load

Site Conditions	Average Annual Cl Concentration (mg/L)	Average Annual Cl Load (lbs/yr)
Existing	40	5.2
Developed with PDFs	15	4.8
Change	-25	-0.4

Comparison with Water Quality Criteria: The predicted chloride concentration in post-development Project runoff is compared to the LA Basin Plan water quality objective and the range of observed concentrations in Santa Clara River Reach 7_E in Table 7-14. The predicted average annual chloride concentration in stormwater runoff from the Project area is at the low end of the range of observed concentrations for this pollutant and is well below the Santa Clara River Reach 7_E Basin Plan water quality objective and the TMDL waste load allocation for Santa Clara River Reach 7_E (100 mg/L for both). Based on the comprehensive site design, source control, and treatment control strategy, and comparison with benchmark receiving water criteria and instream monitoring data, the Project is not expected to have significant water quality impacts resulting from chloride.

Table 7-14: Comparison of Predicted Chloride Concentrations with Water Quality Objective, TMDL, and Observed Concentrations in Santa Clara River Reach 7_E

Pollutant	Predicted Average Annual Concentration (mg/L)	SCR Reach 7_E TMDL Waste Load Allocation & Basin Plan Water Quality Objective[1] (mg/L)	Range of Observed[2] Concentrations in Santa Clara River Reach 7_E (mg/L)
Chloride	15	100	14 – 290[3]

[1] There are no CTR criteria for chloride.
[2]Range of concentrations observed in the Santa Clara River during wet weather at USGS Station 11108500 (located approximately 3 miles downstream of the Project).
[3]This value was observed in 1965.

7.2 Impact Assessment for Pollutants and Basin Plan Criteria Addressed Without Modeling

7.2.1 Turbidity

Turbidity is a measure of suspended matter that interferes with the passage of light through the water or in which visual depth is restricted (Sawyer et al, 1994). Turbidity may be caused by a wide variety of suspended materials, which range in size from colloidal to coarse dispersions, depending upon the degree of turbulence. In lakes or other waters existing under relatively quiescent conditions, most of the turbidity will be due to colloidal and extremely fine dispersions. In rivers under flood conditions, most of the turbidity will be due to relatively coarse dispersions. Erosion of clay and silt soils may contribute to in-stream turbidity (see discussion of hydromodification impacts in Section 7.8 below). Organic materials reaching rivers serve as food for bacteria, and the resulting bacterial growth and other microorganisms that feed upon the bacteria produce additional turbidity. Nutrients in runoff may stimulate the growth of algae, which also contribute to turbidity.

Discharges of turbid runoff are primarily of concern during the construction phase of development. Construction-related impacts are addressed in Section 7.4 below. The Construction Stormwater Pollution Prevention Plan must contain sediment and erosion control BMPs pursuant to the General Construction Permit, and those BMPs must effectively control erosion and discharge of sediment, along with other pollutants, per the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology (BAT/BCT) standards[3]. Additionally, fertilizer control and non-visible pollutant monitoring and

[3] BAT/BCT are Clean Water Act technology-based standards that are applicable to construction site stormwater discharges. Federal law specifies factors relating to the assessment of BAT including: age of the equipment and facilities involved; the process employed; the engineering aspects of the application of various types of control techniques; process changes; the cost of achieving effluent reduction; non-water quality environmental impacts (including energy requirements); and other factors as the Administrator deems appropriate. Clean Water Act §304(b)(2)(B). Factors relating to the assessment of BCT include: reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived; comparison of the cost and level

trash control BMPs in the SWPPP will combine to help control turbidity during the construction phase.

In the post-development condition, placement of impervious surfaces will serve to stabilize soils and to reduce the amount of erosion that may occur from the Project area during storm events, and will therefore decrease turbidity in the runoff from the Project area (see also hydromodification impacts discussed in section 7.8 below). Project PDFs, including source controls (such as common area landscape management and common area litter control) and treatment control BMPs in compliance with the SUSMP requirements, will prevent or reduce the release of organic materials and nutrients (which might contribute to algal blooms) to receiving waters. As shown in Section 7.1 above, post-development nutrients in runoff are not expected to cause significant water quality impacts. Based on implementation of the Project PDFs and the construction-related controls outlined in Section 7.4, runoff discharges from the Project will not cause increases in turbidity which would result in adverse affects to beneficial uses in the receiving waters. Based on these considerations, the water quality impacts of the Project on turbidity are considered less than significant.

7.2.2 Pesticides

Pesticides can be of concern where past farming practices involved the application of persistent organochlorine pesticides. Legacy pesticides Chlordane, Dieldrin, DDT, and Toxaphene are of particular concern, as TMDLs have been established for these pesticides in the Santa Clara River estuary, approximately 40 miles downstream of the Project and this reach of the river. Historical pesticides should no longer be discharged in the watershed except in association with erosion of sediments to which these pollutants may have adhered in the past. Site development involves the import of nearly 6,000,000 cubic yards of dirt from non-agricultural areas, as well as required remedial grading which will stabilize soils and prevent their transport from the Project site, actually reducing the potential for discharge of sediments to which historical pesticides may have adsorbed in pre-development conditions.

In the post-developed condition, pesticides will be applied to common landscaped areas and residential lawns and gardens. Pesticides that have been commonly found in urban streams include the organophosphate pesticides chlorpyrifos and diazinon (Katznelson and Mumley, 1997). However, only 0 to 13% of the samples in the LA County database had detectable levels of diazinon (depending on the land use) while levels of chlorpyrifos were below detection limits for all land uses in all samples taken between 1994 and 2000 (LA County, 2000). Other pesticides presented in the database were seldom measured above detection limits. Furthermore,

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of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources; the age of the equipment and facilities involved; the process employed; the engineering aspects of the application of various types of control techniques; process changes; non-water quality environmental impact (including energy requirements); and other factors as the Administrator deems appropriate. Clean Water Act §304(b)(4)(B). The Administrator of U.S. EPA has not issued regulations specifying BAT or BCT for construction site discharges.

these data represent flows from areas without treatment controls, unlike the proposed Project, which does incorporate treatment control Project design features.

Diazinon and chlorpyrifos are two pesticides of concern due to their potential toxicity in receiving waters. The USEPA has banned all indoor uses of diazinon in 2002 and stopped all sales for all outdoor non-agricultural use in 2003 (USEPA, June, 2002)[4]. With no agricultural uses planned for the proposed Project, diazinon would not be used at the proposed Project site. The USEPA is also phasing out all indoor and outdoor residential uses of chlorpyrifos and has stopped all non-residential uses where children may be exposed. Use of chlorpyrifos in the proposed Project area is not expected, with the possible exception of emergency fire ant eradications until such time as reasonable alternative products are available and only with appropriate application practices in accordance with the golf course and landscape pesticide management program.

Source control measures such as education programs for owners, occupants, and employees in the proper application, storage, and disposal of pesticides are the most promising strategies for controlling the pesticides that will be used post-development. Structural treatment controls are less practical because of the variety of pesticides and wide range of chemical properties that affect their ability to treat these compounds. However, most pesticides, including historical pesticides that may be present at the site, are relatively insoluble in water and therefore tend to adsorb to the surfaces of sediment, which will be stabilized with development, or if eroded, will be settled or filtered out of the water column in the water quality treatment PDFs. Thus, treatment in the bioretention, vegetated swales, and extended detention basin should achieve some removal of pesticides from stormwater as TSS is reduced.

For common area landscaping in commercial areas, multi-family residential areas, and parks, an Integrated Pest Management (IPM) Program will be incorporated. The goal of an IPM is to keep pest levels at or below threshold levels, reducing risk and damage from pest presence, while eliminating the risk from the pest control methods used. IPM programs achieve these goals through the use of low risk management options by emphasizing use of natural biological methods and the appropriate use of selective pesticides. IPM programs also incorporate

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[4] Changes to the use of chlorpyrifos include reductions in the residue tolerances for agricultural use, phases out nearly all indoor and outdoor residential uses, and also stops non-residential uses where children may be exposed. In Orange County, residential use accounts for around 90% of total chlorpyrifos (USEPA, June 2002). Retail sales of chlorpyrifos were stopped by December 31, 2001, and structural (e.g. construction) uses will be phased out by December 31, 2005. Some continued uses will be allowed, for example public health use for fire ant eradication and mosquito control will be permitted by professionals.

Permissible uses of diazinon will also be restricted. All indoor uses are prohibited (as of 12/2002) and retailers were required to end sales for indoor use on December, 2002. All outdoor non-agricultural uses were phased out by December 31, 2004. Therefore it is likely that the EPA agreement will eliminate most of the use of diazinon within the NRSP area. The use of diazinon for many agricultural crops has been eliminated (USEPA 2001), while some use of this chemical will continue to be permitted for some agricultural activities.

environmental consideration by implementing procedures that minimize intrusion and alteration of biodiversity in ecosystems.

While pesticides are subject to degradation, they vary in how long they maintain their ability to eradicate pests. Some break down almost immediately into nontoxic byproducts, while others can remain active for longer periods of time. While pesticides that degrade rapidly are less likely to adversely affect non-targeted organisms, in some instances it may be more advantageous to apply longer-lasting pesticides if it results in fewer applications or smaller amounts of pesticide use. As part of the Integrated Pest Management program, careful consideration will be made as to the appropriate type of pesticides for use on the Project site. While pesticide use is likely to occur due to maintenance of landscaped areas, particularly in the residential portions of the development, careful selection, storage and application of these chemicals for use in common areas per the IPM Program following LAUSD standards (set forth in Appendix D), will help prevent adverse water quality impacts from occurring. Additionally, as discussed above, removal of sediments in the PDFs will also remove sediment-adsorbed pesticides.

Based on the incorporation of site design, source control, and treatment control BMPs pursuant to SUSMP requirements and the use of an Integrated Pest Management Program, potential post-development impacts associated with pesticides are expected to be less than significant.

Transport of legacy pesticides adsorbed to existing site sediments may be a concern during the construction phase of development. Construction-related impacts are addressed in Section 7.4 below. The Construction Stormwater Pollution Prevention Plan must contain sediment and erosion control BMPs pursuant to the General Construction Permit, and those BMPs must effectively control erosion and the discharge of sediment along with other pollutants per the BAT/BCT standards. Based on these sediment controls, construction-related impacts associated with pesticides are expected to be less than significant.

7.2.3 Pathogens

Pathogens are viruses, bacteria, and protozoa that can cause illness in humans. Identifying pathogens in water is difficult as the number of pathogens is exceedingly small requiring sampling and filtering large volumes of water. Traditionally, water managers have relied on measuring “pathogen indicators”, such as total and fecal coliform, as an indirect measure of the presence of pathogens. Although such indicators were considered reliable for sewage samples, indicator organisms are not necessarily reliable indicators of viable pathogenic viruses, bacteria, or protozoa in stormwater because coliform bacteria, in addition to being found in the digestive systems of warm-blooded animals, are also found in plants and soil. Moreover, certain pathogen indicators can multiply in the field if the substrate, temperature, moisture, and nutrient conditions are suitable. In a review of bacteria monitoring data in Southern California, Paulsen and List summarized the debate over the use of pathogenic indicators and pointed out that scientific studies show no correlation between pathogens and therefore may not indicate a significant potential for causing human illness (Paulsen and List, 2005, provided in Appendix E). In a recent

field study conducted by Schroeder et. al., pathogens (in the form of viruses, bacteria, or protozoa) were found to occur in 12 of 97 samples taken, but the samples that contained pathogens did not correlate with the concentrations of indicator organisms (Schroeder et. al. 2002).

There are numerous sources of pathogen indicators, including birds and other wildlife, domesticated animals and pets, and plant matter and soils. Human-related sources may include poorly functioning septic systems, cross-connections between sewer and storm drains, and the utilization of outdoor areas for human waste disposal by people without access to indoor sanitary facilities.

There are extensive studies in which samples have been collected and analyzed for bacteria. Almost all of these data do not distinguish bacteria that may result from new development versus bacteria from other sources. Runoff from new development is just one of many potential sources of bacteria in urban runoff. Urban runoff reflects both anthropogenic and natural sources, and consists of runoff from existing development, new development, and open space or vacant land. The large majority of existing development areas that contribute runoff into the monitored channels of Los Angeles County and other areas do not have the myriad of Project design features that have been incorporated into the proposed Project, see further discussions below. Consequently, it is likely that runoff from the proposed Project will not contain the same elevated levels of bacteria found in other urban runoff studies.

Available studies do not uniformly suggest that development increases indicator bacteria in runoff. For example, the City of San Diego currently monitors 20 shoreline stations within Mission Bay. Analysis of the 7,300 samples collected between 1987 and 1994 indicated that the highest geometric mean densities of total coliform, fecal coliform, and enterococcus occurred from December through March, which are historically the wettest months of the year in San Diego (Schiff and Kinney, 2000). Differences in mean densities between winter and summer months ranged over two orders of magnitude. The data also indicated that geometric densities for total coliform, fecal coliform, and enterococcus were always higher in wet weather samples than in dry weather samples. In a related study, 22 out of the 89 storm drain outfalls that discharge into Mission Bay were sampled during wet and dry weather. Only half of the storm drains contained measurable densities of indicator bacteria during dry weather while all 22 storm drains exceed water quality objectives during wet weather. The data also showed that indicator bacteria densities were as high from open space at the head of the watershed as at the mouth of the bay, indicating similar indicator bacteria contributions from urban and non-urban sources (Schiff and Kinney, 2000).

In addition to the Mission Bay data, the USEPA has compiled an extensive stormwater database with data from 65 programs in 17 states throughout the United States (Pitt et al, 2003). The data indicate that median fecal coliform concentrations range from about 4,500 to 7,700 MPN/100mL for a range of commercial and residential land uses (land areas generally not having the type of

source and treatment controls incorporated into the proposed Project and thus not indicative of runoff from the proposed Project). Runoff from agricultural watersheds involving horticulture and row cropping is known to similarly contain relatively high levels of indicator bacteria. Data from a stormwater drain serving an agricultural watershed with predominantly row crops in nearby Ventura County showed similar median fecal coliform levels (~ 7000 MPN/100 mL) to that found for general urban runoff (Ventura County, 2005). Agricultural land probably shares some of same wildlife sources found in open land, but farm animals may be present as well. These data indicate that wildlife, farm animals, plants and/or soils can be a very important source of pathogens and/or pathogen indicators such as fecal coliform. The Project, by converting agricultural land to urban land uses, could potentially reduce the pathogen contribution associated with agriculture.

Additionally, Paulsen and List (Flow Science, 2005) found that indicator bacteria concentrations in receiving waters downstream from developed/urban watersheds were essentially the same concentrations as in receiving waters downstream from undeveloped watersheds. This study support the conclusion that the development of the proposed Project is not expected to result in appreciably higher indicator bacteria levels in receiving waters relative to undeveloped conditions.

This conclusion that urban development is no different than undeveloped areas in producing elevated bacteria levels is also supported by studies on runoff from areas in Northern Coastal Orange County, Southern Orange County, Los Angeles and San Diego. Studies by Schiff et al. and Grant et al. indicate that runoff from urban areas may not be the sole or even primary source of elevated bacteria in receiving waters, but that such elevated levels may be caused by non-human sources, such as terrestrial wildlife and birds or even local sediments (Schiff & Kinney, 2001 (evaluating Mission Bay in San Diego) and Grant et al., 2001 (evaluating Huntington Beach in Orange County)). Furthermore, data collected from undeveloped watersheds or watersheds with little development indicate that bacterial standards are often exceeded when runoff comes from open space areas (Moore, 2001 and LADPW, 2001). For example, data obtained by the Serrano Water District during 2003 in a largely undeveloped watershed, Santiago Creek Reach 3, which is located upstream of Irvine Lake in Orange County, showed a total coliform concentration of 80,000 MPN/100 mL (compared to MUN water quality criteria of 100 MPN/100 mL) and a corresponding concentration of fecal coliform of 700 MPN/100 mL (compared to REC 1 water quality criteria of 400 MPN/100 mL). For a review of the history of water quality bacterial standard development, as well as a review of the LA Basin Plan in relation to these standards, a report by Paulsen and List (2003) is attached to this document as Attachment D. Paulsen and List compare bacterial standards with undeveloped land use data relevant to the Los Angeles Area, and suggest that bacterial standards for river reaches whose beneficial uses do not include primary human contact recreation may be unnecessary.

With particular regard to dry weather flows from urban areas, information from the MEC studies in Mission Bay (MEC, Mission Bay Clean Beaches Initiative Final Report (2004)) and

Grant studies supports the idea that the Project will not significantly impact bacteria levels in receiving waters. The MEC study indicates that even with diversion of dry weather urban flows during the summer dry season, indicator bacteria samples in receiving waters still were not at acceptable regulatory levels. Moreover, the Grant study found that significant bacterial die off occurred before dry weather flows reached receiving waters, leading the authors to conclude that other sources (including avian sources) were the predominant source of bacteria to Huntington Beach State Park beaches and that dry weather flows were less significant than other sources of bacteria to the receiving waters.

For the proposed Project, significant efforts have been made to reduce dry weather flows through Project design features such as efficient irrigation systems, use of natural landscaping palettes, and infiltration/evaporation in treatment control facilities, making it unlikely that dry weather flows will persist as far as receiving waters. Even in the unlikely event that dry weather flows from the proposed Project were to reach receiving waters, based upon the Grant and Schiff studies, it is not likely that such dry weather flows would noticeably increase bacteria concentrations in the receiving waters.

Based on findings of these studies, it is possible that predominant sources of bacteria in the Project's receiving waters (in either existing conditions or proposed Project conditions) may be soils, birds, or other wildlife found either within or on the waterbodies themselves or in the watersheds tributary to the receiving waters. These studies also suggest that the elevated levels of bacteria already present in receiving waters in the existing condition (see Existing Water Quality, Section 2-8) will not be altered substantially by the development of the proposed Project. Also, as discussed in greater detail below, non-human sources of bacterial indicators may not reflect human health concerns pertinent to contact recreation use designations of local receiving waters. For all of these reasons, the LARWQCB determined in their consideration of bacteria TMDLs for Santa Monica Bay that numeric standards were inappropriate for controlling stormwater and non-point source runoff water quality.

Regarding the use of fecal coliform as a bacterial indicator, the fecal coliform standards contained in the Los Angeles Basin Plan were recommended in 1968 and were based upon epidemiological studies conducted in 1948, 1949, and 1950. Several studies conducted since 1968 have questioned these criteria, recognizing that high levels of pathogen indicators due to natural sources of pollution do occur, and recommended use of alternatives (EPA, 1986; EPA, 1972). Subsequent studies initiated by the USEPA were conducted at sites contaminated either with pollution from multiple or single point sources and found that fecal coliform densities showed "little or no correlation" to gastrointestinal illness rates in swimmers (Dufour, 1984). Thus, EPA in 1986 proposed criteria for contact recreation based upon *E. coli* and/or enterococci rather than fecal coliform (EPA, 1986)

Bacterial indicators in receiving water samples are not an adequate proxy for determining significant water quality impacts of proposed development. Because measurements of indicator

bacteria are not direct measurements of pathogens (and associated human health risk), many epidemiological studies have found conflicting results, and often fail to indicate a consistent relationship between a given bacteria indicator and a human-related illness (e.g., gastrointestinal illness). (Fleisher, et al., 1996). Furthermore, a comprehensive survey of the epidemiological literature found that viral indicators were significantly stronger predictors of gastrointestinal illness than bacteria indicators (Wade, et al., 2003). Several additional studies also indicate that public health risk (relevant to human-contact recreational uses) does not correlate with elevated levels of bacterial indicators in receiving waters, even in waters impacted by urban runoff (Schroeder, 2002). The Schroeder study analyzed highway runoff and found no correlation between the measured indicator organisms and the presence of pathogens. Similarly, a study of both pathogens and indicator bacteria in Southern California coastal waters impacted by urban runoff indicated that exceedances of bacteria indicators did not correlate with the presence of human adenoviruses and thus may not have indicated a human health risk (S. Jiang, et al., 2001). The USEPA also has indicated that non-human sources of fecal contamination need not be considered in determinations of water quality standard attainment (EPA, 2004); meaning that if non-human bacteria sources are shown to be minimal and exposure to such sources based on epidemiological studies do not appear to result in human health risks, bacteria standards may be interpreted to relate only to human-derived bacteria. The World Health Organization (WHO) has adopted a similar approach, recognizing that "due to the 'species barrier,' the density of pathogens of public health importance is generally assumed to be less in aggregate in animal excreta than in human excreta which may therefore represent a significantly lower risk to human health" (WHO, 2003). Based on the information discussed above, the reliance on bacterial indicators to gage potential impacts human health-related beneficial uses in the Project's receiving waters would not be prudent.

It is recognized that natural levels of bacteria are present in the Project area receiving waters and that control of such natural sources of bacteria is neither required nor desired by regulatory authorities. Both the San Diego and Los Angeles Regional Water Quality Control Boards have made provisions for background sources of bacteria from undeveloped portions of watersheds in their Bacteria Total Maximum Daily Loads (LARWQCB, 2002; San Diego RWQCB, 2004). To illustrate, the Los Angeles RWQCB stated that it was not their intent to "require treatment of natural sources of bacteria from undeveloped areas" as removal of such natural sources of bacteria from receiving waters "could adversely affect valuable aquatic life and wildlife beneficial uses supported by natural water bodies in the Region." Thus, the Project design features for the proposed Project have appropriately focused on the control of potential anthropogenic bacteria sources.

The primary sources of fecal coliforms from the Project would likely be pet wastes, and wildlife or vectors living in the storm drain itself. Other sources of pathogens and pathogen indicators, such as cross connections between sanitary and storm sewers, and other human-derived bacteria, are unlikely given the new systems to be installed with the Project, modern sanitary sewer installation methods, and inspection and maintenance practices.

The levels of bacteria in runoff from the proposed Project will be reduced by virtue of:

- Source Controls, and
- Treatment Controls.

The most effective means of controlling pet wastes as a source of pathogens is through source control, specifically education of pet owners, and providing products and disposal containers that encourage and facilitate cleaning up after pets. Storm drain cleaning practices help to remove pathogens that may have accumulated in the storm drain system.

There is some data on the effectiveness of water quality basins to treat pathogen indicators. However the treatment processes known to be occurring in the water quality basins involve sunlight (ultraviolet light) degradation, sedimentation of bacteria attached to particulates, and infiltration , all of which reduce pathogen levels. A study of microbial removals in various BMPs conducted in Florida indicated that shallow wet basins with a five day drain time achieved about a 98 percent removal efficiency for fecal coliform (Kurz, 1999). The water quality basins proposed for the Project will drain in two days or less, therefore the expected pathogen removal would be somewhat less than 98 percent. According to the California State Stormwater BMP Handbook for New Development and Redevelopment, extended detention basins are considered to have a "medium" removal effectiveness. The Center for Watershed Protection maintains a National Pollutant Removal Performance Database that indicates that removal performance for various types of water quality basins ranges between 70 to 80 percent (CWP, 2000). The database indicated a removal of about 78 percent for dry extended detention basins. Data on wetponds (similar to the proposed design of the water quality basins) from the International Best Management Practice Database demonstrate an almost 80 percent reduction in median fecal coliform concentrations when comparing inlet to outlet concentrations (Strecker, et al., 2004). In addition, the water quality basins, bioretention areas, and bioretention areas will also have the effect of reducing the volume of stormwater and dry weather runoff from the proposed Project area, thereby reducing any associated bacteria.

In summary, the proposed Project, consistent with the SUSMP requirements, includes a comprehensive set of source and treatment control PDFs selected to manage pathogen indicators which, in combination, will reduce pathogen indicator levels in runoff from the proposed Project. With this series of PDFs, the Project will not result in appreciable changes in pathogen indicator levels in the receiving waters compared to existing conditions, and potential bacteria-related water quality impacts, including those associated with total coliform, are considered less than significant.

7.2.4 Hydrocarbons

Various forms of hydrocarbons (oil and grease) are common constituents associated with urban runoff; however, these constituents are difficult to measure and are typically measured with grab

samples, making it difficult to develop reliable EMCs for modeling. Based on this consideration, hydrocarbons were not modeled but are addressed qualitatively.

Hydrocarbons are a broad class of compounds, most of which are non-toxic. Hydrocarbons are hydrophobic (low solubility in water), have the potential to volatilize, and most forms are biodegradable. A subset of hydrocarbons, Polynuclear Aromatic Hydrocarbons (PAHs) can be toxic depending on the concentration levels, exposure history, and sensitivity of the receptor organisms. Of particular concern are those PAH compounds associated with transportation-related sources.

Although the concentration of hydrocarbons in runoff is expected to increase slightly under post-development Project conditions due to the increase in roadways, driveways, parking areas, and vehicle use, the Project PDFs are expected to prevent appreciable increases in hydrocarbon concentrations from leaving the Project site. Source control PDFs that address petroleum hydrocarbons include educational materials on used oil programs, carpooling, and public transportation alternatives to driving; BMP maintenance; and street sweeping private streets. Although vehicle emissions and leaks are the primary source of hydrocarbons in urban areas, it is anticipated that vehicles in the proposed development will in general be well maintained and newer models which will help to limit emissions and leaks. Lastly, the parking lot site design, source controls, treatment BMPs and vegetation and soils within the treatment control PDFs will adsorb the low levels of emulsified oils in stormwater runoff, preventing discharge of hydrocarbons and visible film in the discharge or the coating of objects in the receiving water.

The majority of PAHs in stormwater adsorb to the organic carbon fraction of particulates in the runoff, including soot carbon generated from vehicle exhaust (Ribes et al, 2003). For example, a stormwater runoff study by Marslek et. al. (1997) found that the dissolved-phase PAHs represented less than 11 percent of the total concentration of PAHs. Consequently, the bioretention areas and vegetated swales proposed as PDFs, which are designed to treat pollutants through settling, filtration, and infiltration, will be effective at treating PAHs.

Los Angeles County conducted PAH analyses on 27 stormwater samples from a variety of land uses in the period 1994-2000 (Los Angeles County, 2000). For those land uses where sufficient samples were taken and were above detection levels to estimate statistics, the mean concentrations of individual PAH compounds ranged from 0.04 to 0.83 µg/L. The reported means were less than acute toxicity criteria available from the literature (Suter and Tsao, 1996). Moreover, the Los Angeles County data do not account for any treatment, whereas the treatment in the Project's PDFs should result in a reduction in hydrocarbon concentrations inclusive of PAHs. This makes it very unlikely that impacts will occur to the receiving water due to hydrocarbon loads or concentrations. On this basis, the effect of the Project on petroleum hydrocarbon levels in the receiving waters post-development is considered less than significant.

During the construction phase of the Project, hydrocarbons in site runoff could result from construction equipment/vehicle fueling or spills. Construction related impacts are addressed in Section 7.4 below. However, pursuant to the General Construction Permit, the Construction Stormwater Pollution Prevention Plan must include BMPs that address proper handling of petroleum products on the construction site, such as proper petroleum product storage and spill response practices, and those BMPs must effectively prevent the release of hydrocarbons to runoff per the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology standards. PAH that are adsorbed to sediment during the construction phase would be effectively controlled via the erosion and sediment control BMPs. For these reasons, construction-related impacts related to hydrocarbons on water quality are considered less than significant.

7.2.5 Trash and Debris

Urban development tends to generate significant amounts of trash and debris. Trash refers to any human-derived materials including paper, plastics, metals, glass and cloth. Debris is defined as any organic material transported by stormwater, including leaves, twigs, and grass clippings (DLWC, 1996). Debris can be associated with the natural condition. Trash and debris is often characterized as material retained on a 5-mm mesh screen. It contributes to the degradation of receiving waters by imposing an oxygen demand, attracting pests, disturbing physical habitats, clogging storm drains and conveyance culverts and mobilizing nutrients, pathogens, metals, and other pollutants that may be attached to the surface. Sources of trash in developed areas can be both accidental and intentional. During wet weather events, gross debris deposited on paved surfaces can be transported to storm drains, where it can be eventually discharged to receiving waters. Trash and debris can also be mobilized by wind and transported directly into waterways. Trash and debris can impose an oxygen demand on the water body as organic matter decomposes.

Urbanization could significantly increase trash and debris loads if left unchecked. However, the Project PDFs, including source control and treatment BMPs, will minimize the adverse impacts of trash and debris. Source controls such as street sweeping, public education, fines for littering, and storm drain stenciling can be effective in reducing the amount of trash and debris that is available for mobilization during wet and dry weather events. Common area litter control will include a litter patrol, covered trash receptacles, emptying of trash receptacles in a timely fashion, and noting trash violations by tenants/homeowners or businesses and reporting the violations to the owner/HOA for investigation. Catch basin inserts will be provided for parking lots. The Project's PDFs will remove or prevent the release of floating materials, including solids, liquids, foam, or scum, from runoff discharges and will prevent impacts on dissolved oxygen in the receiving water due to decomposing debris. Based on these considerations, post-development trash and debris is not expected to significantly impact the receiving waters of the Project.

During the construction phase of the Project, there is potential for an increase trash and debris loads due to lack of proper Contractor good housekeeping practices at the construction site. Per the General Construction Permit, the SWPPP for the site will include BMPs for trash control (catch basin inserts, good housekeeping practices, etc.). Compliance with the Permit Requirements and inclusion of these BMPs, meeting BAT/BCT, included in the SWPPP will mitigate impacts from trash and debris to a level less than significant. See Section 7.4 below for a full discussion of Construction Related Impacts.

7.2.6 Methylene Blue Activated Substances (MBAS)

MBAS, which is related to the presence of detergents in runoff, may be incidentally associated with urban development due to commercial and/or residential vehicle washing or other outdoor washing activities. Surfactants disturb the surface tension which affects insects and can affect gills in aquatic life.

The presence of soap in runoff from the Project will be controlled through the source control PDFs, including a public education program on residential and charity car washing, and the provision of a car wash pad connected to sanitary sewer in the multi-family residential areas. Other sources of MBAS, such as cross connections between sanitary and storm sewers, are unlikely given modern sanitary sewer installation methods and inspection and maintenance practices. Therefore, MBAS are not expected to significantly impact the receiving waters of the proposed Project.

7.3 MS4 Permit Requirements for New Development as Defined in the SUSMP

Project Design Features (PDFs) include site design, source control, and treatment control BMPs in compliance with the SUSMP requirements, as described in Section 5.1 and summarized in Table 5-1. Treatment control PDFs will treat runoff from the entire urban portion of the Project area. Sizing criteria contained in the MS4 Permit and the SUSMP requirements will be met for all treatment control BMPs.

In summary, the proposed site design, source control, and treatment control PDFs have been selected for the Project based on:

- effectiveness for addressing pollutants of concern in runoff from the Project, resulting in insignificant water quality impacts;
- sizing and outlet design consistent with the MS4 Permit and SUSMP requirements;
- additional design guidance consistent with the California BMP Handbook: New Development and Redevelopment, other literature, and best professional judgment;
- hydrologic and water quality modeling to verify performance;

- meeting mean annual percent capture criteria contained in the California BMP New Development Manual; and
- providing specific O&M requirements to inspect and maintain the facilities.

On this basis, the proposed PDFs meet the MS4 Permit requirements for new development.

7.4 Construction-related Impacts

The potential impacts of construction activities, construction materials, and non-stormwater runoff on water quality focus primarily on sediment (TSS and turbidity). Construction-related activities that are primarily responsible for sediment releases are related to exposing soils to potential mobilization by rainfall/runoff and wind. Such activities include removal of vegetation from the site, grading of the site, and trenching for infrastructure improvements. Environmental factors that affect erosion include topographic, soil, and rainfall characteristics. Non sediment-related pollutants that are also of concern during construction relate to construction materials and non-stormwater flows and include waste construction materials; chemicals, liquid products, petroleum hydrocarbon products used in building construction or the maintenance of heavy equipment; and concrete-related waste streams.

Construction impacts due to the Project development, including the borrow source activities and in-stream construction elements of the Project, will be minimized through compliance with the General Construction Permit. This permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which must include erosion and sediment control BMPs that will meet or exceed measures required by the General Construction Permit, as well as BMPs that control the other potential construction-related pollutants. A SWPPP will be developed as required by, and in compliance with, the General Construction Permit and the County of Los Angeles Standard Conditions. Erosion control BMPs are designed to prevent erosion, whereas sediment controls are designed to trap sediment once it has been mobilized. The General Permit requires the SWPPP to include a menu of BMPs to be selected and implemented based on the phase of construction and the weather conditions to effectively control erosion and sediment to the BAT/BCT. BMPs to be included in this menu include, among others: slope stabilization using rock or vegetation, re-vegetation, hydro-seeding or using tackifiers on exposed areas and stockpiles, installation of energy dissipators, drop structures, catch basin inlet protection, construction materials management, and cover and containment of construction materials and wastes. This permit requires BMP selection, implementation, and maintenance during the construction phase of development.

The significance criteria for the construction phase of the Project is implementation of BMPs consistent with Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology (BAT/BCT), as required by the Construction General Permit and the general waste discharge requirements in the Dewatering General Permit. The Project will reduce or prevent erosion and sediment transport and transport of other potential pollutants from

the Project site during the construction phase through implementation of BMPs meeting BAT/BCT in order to prevent or minimize environmental impacts and to ensure that discharges during the construction phase of the Project will not cause or contribute to any exceedance of water quality standards in the receiving waters. These BMPs will assure effective control of not only sediment discharge, but also of pollutants associated with sediments, such as and not limited to nutrients, heavy metals, and certain pesticides, including legacy pesticides.

Construction on the Project site may require dewatering and non-stormwater related discharges. For example, dewatering may be necessary for the construction of bridge abutments, bank stabilization, and outfall protection; if groundwater is encountered during grading; or to allow discharges associated with testing of water lines, sprinkler systems and other facilities.

In general, the General Construction Permit authorizes construction dewatering activities and other construction related non-stormwater discharges as long as they (a) comply with Section A.9 of the General Permit; (b) do not cause or contribute to violation of any water quality standards, (c) do not violate any other provisions of the General Permit, (d) do not require a non-stormwater permit as issued by some RWQCBs, and (e) are not prohibited by a Basin Plan provision. Full compliance with applicable local, state and federal water quality standards by the applicant would assure that potential impacts from dewatering discharges are not significant.

An additional Project design feature will be implemented to protect receiving waters from dewatering and construction related non-stormwater discharges. Such discharges will be implemented in compliance with the Los Angeles RWQCB's General Waste Discharge Requirements (WDRs) under Order No. R4-2003-0111, NPDES No. CAG994004 governing construction-related dewatering discharges within the Project development areas. Typical BMPs for construction dewatering include infiltration of clean groundwater; on-site treatment using suitable treatment technologies; on-site or transport offsite for sanitary sewer discharge with local sewer district approval; or use of a sedimentation bag for small volumes of localized dewatering. Compliance with these WDRs constitutes a PDF for the Project, further assuring that the impacts of these discharges are not significant.

On this basis, the impact of construction-related runoff from the Project is considered less than significant.

7.5 Pollutant Bioaccumulation

Certain pollutants have the potential to accumulate in treatment BMP vegetation and soils, potentially increasing the risk of exposure to wildlife and the food chain. Factors that could affect the extent of potential bioaccumulation, include:

- The bioavailability of the pollutant

- Conditions in the soils (e.g., pH, acid-volatile sulfide concentration, organic content) that affect the form and bioavailability of the pollutant;
- The efficiency by which pollutants in the soils enter the plant community, the storage of these pollutants in plant tissues that are edible, and the utilization of the plants as a food source by animals;
- The type of habitats, organisms attracted to these habitats, and their feeding habits; and
- System design and maintenance

The potential for bioaccumulation impacts from the proposed bioretention and vegetated swale facilities will be minimal. Since the site is largely impervious, very little coarse solids and associated pollutants are expected to be generated. The vegetation in the facilities will trap sediments and pollutants in the soils, which contain bacteria that metabolize and transform trace metals, therefore reducing the potential for these pollutants to enter the food chain. The facilities do not provide open water areas and are not likely to attract waterfowl.

In the literature, the primary pollutants that are of concern with regard to bioaccumulation are mercury and selenium. However, selenium and mercury are not naturally present at levels of concern in this watershed and will not be introduced by the Project. Therefore, bioaccumulation of selenium and mercury is not expected.

Bioaccumulation of pollutants in the Santa Clara River is not of concern due to the low concentrations of pollutants, below the benchmark Basin Plan objectives and CTR criteria, predicted in the treated runoff. Also, sediments in the Santa Clara River are transported downstream in the wet season by storm flows, and therefore do not accumulate.

On this basis, the potential for bioaccumulation and adverse effects on waterfowl and other species is considered less than significant.

7.6 Dry Weather Runoff

While there are no specific requirements in the MS4 Permit and the SUSMP requirements to treat dry-weather discharges from the Project area, pollutants in dry weather flows could also be of concern because dry weather flow conditions occur throughout a large majority of the year, and because some of the TMDLs in downstream reaches of the Santa Clara River are applicable for dry weather conditions (e.g., nutrients and chloride).

Dry weather flows are typically low in sediment because the flows are relatively low and coarse suspended sediment tends to settle out or is filtered out by vegetation. As a consequence, pollutants that tend to be associated with suspended solids (e.g., phosphorus, some bacteria, some trace metals, and some pesticides) are typically found in very low concentrations in dry weather flows. The focus of the following discussion is therefore on constituents that tend to be

dissolved, e.g., nitrate and trace metals, or constituents that are so small as to be effectively transported, e.g., pathogens and oil and grease.

In order to minimize the potential generation and transport of dissolved constituents, landscaping in public and common areas will utilize drought tolerant vegetation that requires little watering and chemical application. Landscape watering in common areas, commercial areas, multiple family residential areas, and in parks will use efficient irrigation technology utilizing evapotranspiration sensors to minimize excess watering.

In addition, educational programs and distribution of materials (source controls) will emphasize appropriate car washing locations (at commercial car washing facilities or the car wash pad in the multi-family residential areas) and techniques (minimizing usage of soap and water), encourage low impact landscaping and appropriate watering techniques, and discourage driveway and sidewalk washing. Illegal dumping will be discouraged by stenciling storm drain inlets and posting signs that illustrate the connection between the storm drain system and the receiving waters and natural systems downstream.

The bioretention areas, vegetated swales, and the extended detention basin will provide treatment for and infiltrate dry weather flows and small storm events. Water cleansing is a natural function of vegetation, offering a range of treatment mechanisms. Sedimentation of particulates is the major removal mechanism. However the performance is enhanced as plant materials allow pollutants to come in contact with vegetation and soils containing bacteria that metabolize and transform pollutants, especially nutrients and trace metals. Plants also take up nutrients in their root system. Some pathogens would be removed through ultraviolet light degradation. Any oil and grease will be effectively adsorbed by the vegetation and soil within the low flow wetland vegetation. Dry weather flows and small storm flows will infiltrate into the bottom of the basin after receiving treatment in the low flow wetland vegetation. The swales and bioretention basins will not be designed to have open pools of standing water.

The Orange County Public Health Laboratory conducted a monitoring study in 1998 in the San Juan Creek watershed to help determine the sources of pathogen indicators during dry weather conditions (Moore et al, 2002). Monitoring stations were located in the ocean, in creeks in the San Juan Creek watershed, and in storm drains. One finding of the study was that "the highest concentrations of fecal coliforms and *Enterococcus* were found in the storm drains as compared to the creeks and ocean sampling sites. Samples taken from creek sites distant to human habitat also had low to moderate levels of bacteria, suggestive of fecal contamination by non-human sources." The principal anthropogenic sources of pathogens into dry weather flows is leaking septic systems, cross-connections between sanitary sewers and storm drains, or leakage from the sanitary sewer system into groundwater, which feeds the dry and non-storm flows. However, the Project will be new development with new storm drains and sanitary sewer systems, which are expected to have minimal, if any, leakage.

The treatment control PDFs will infiltrate or evapotranspire all expected dry weather runoff from the Project (see Section 7.9.2 below). It is expected that no dry weather discharge will occur to the Santa Clara River from the Project. Based on source control PDFs reducing the amount of dry weather runoff and treatment control PDFs capturing and treating the dry weather runoff that does occur, the impact from dry weather flows is considered less than significant.

7.7 Summary of Surface Water Quality Impacts

7.7.1 Direct Impacts

With the exception of runoff volume, dissolved copper loads, and dissolved zinc loads, concentrations and loads of modeled constituents are predicted to decrease under proposed conditions when compared to existing conditions. The modeled concentrations in runoff from developed areas with PDFs are below all benchmark water quality objectives and criteria and TMDL waste load allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy, and compliance with SUSMP, General Construction Permit, and General De-Watering Permit requirements.

Concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may or may not increase under proposed conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 Permit Requirements, General Construction Permit, and General De-Watering Permit requirements. Therefore potential impacts from the Project on receiving water quality are not expected to be significant.

7.7.2 Cumulative Impacts

As discussed above, the anticipated quality of effluent expected from the Project's PDFs will not contribute loads or concentrations of pollutants of concern that would be expected to cause or contribute to a violation of the water quality standards in the Project's receiving waters. Therefore, the Project's incremental effects on surface water quality are not expected to be significant.

The Project's surface runoff water quality, after PDFs, both during construction and post-development, is predicted to comply with adopted regulatory requirements that are designed by the LARWQCB to assure that regional development does not adversely affect water quality, including MS4 Permit and SUSMP requirements; General Construction Permit requirements; General Dewatering Permit requirements; and benchmark Basin Plan water quality objectives, CTR criteria, and TMDLs. Any future urban development occurring in the Santa Clara River watershed must also comply with these requirements. Therefore, cumulative impacts on surface

water quality of receiving waters from the proposed Project and future urban development in the Santa Clara Watershed are addressed through compliance with the MS4 Permit and SUSMP requirements; General Construction Permit requirements; General Dewatering Permit requirements; and benchmark Basin Plan water quality objectives, CTR criteria, and TMDLs, which are intended to be protective of beneficial uses of the receiving waters. Based on compliance with these requirements designed to protect beneficial uses, cumulative water quality impacts are mitigated to a level that is less than significant.

7.8 Groundwater Impacts

7.8.1 Direct Groundwater Quality Impacts

Discharge from the Project's developed areas to groundwater will occur at three locations: (1) through general infiltration of irrigation water, (2) through incidental infiltration of urban runoff in the proposed treatment control PDFs after treatment, and (3) infiltration of urban runoff, after treatment in the Project PDFs, in the Santa Clara River, which is the primary recharge zone for groundwater in the Santa Clara Valley. Groundwater quality will be fully protected through implement of the Project's site design, source control, and treatment control PDFs prior to discharge of Project runoff to groundwater.

The pollutant of concern with respect to groundwater is nitrate-N plus nitrite-N. The Basin Plan groundwater quality objective for nitrate-nitrogen plus nitrite-nitrogen is 10 mg/L (which is more stringent than the objective for nitrate-nitrogen alone (10 mg/L) and for nitrite-nitrogen alone (1 mg/L)). The predicted nitrate-nitrogen plus nitrite-nitrogen concentration in runoff after treatment in the Project PDFs is 0.8 mg/L, which is well below the groundwater quality objective. The typical irrigation water supply nitrate-nitrogen concentration is 0.63 mg/L, which is also well below the groundwater quality objective (CLWD, 2003).

On this basis, the potential for adversely affecting groundwater quality is considered less than significant.

7.8.2 Cumulative Groundwater Quality Impacts

As discussed above, the anticipated quality of stormwater runoff discharges from the Project's developed areas and irrigation to groundwater will not contribute loads or concentrations of pollutants of concern that would be expected to cause or contribute to a violation of the groundwater quality standards. Therefore, the Project's incremental effects on groundwater quality are not expected to be significant.

The Project's discharges to groundwater, after PDFs, both during construction and post-development, is predicted to comply with adopted regulatory requirements that are designed by the LARWQCB to assure that regional development does not adversely affect water quality, including MS4 Permit and SUSMP requirements; General Construction Permit requirements;

General Dewatering Permit requirements; and benchmark Basin Plan groundwater quality objectives. Any future urban development occurring in the Santa Clara River watershed must also comply with these requirements. Therefore, cumulative impacts on groundwater quality from the proposed Project and future urban development in the Santa Clara Watershed are addressed through compliance with the MS4 Permit and SUSMP requirements, General Construction Permit requirements, General Dewatering Permit requirements, and benchmark Basin Plan groundwater quality objectives, which are intended to be protective of beneficial uses of the groundwater. Based on compliance with these requirements designed to protect beneficial uses, cumulative groundwater quality impacts are mitigated to a level that is less than significant.

7.8.3 Groundwater Recharge Impacts

Direct Project Impacts

In a groundwater basin, the effect of urbanization on recharge to underlying groundwater is dependent on land uses, water uses, vegetative cover, and geologic conditions. Groundwater recharge from undeveloped lands occurs from precipitation alone, whereas areas that are developed for agricultural or urban land uses receive both precipitation and irrigation of vegetative cover. In an urban area, groundwater recharge occurs directly beneath irrigated lands and in drainages whose bottoms are not paved or cemented. A memorandum prepared by CH2M Hill entitled "Effect of Urbanization on Aquifer Recharge in the Santa Clarita Valley" (Appendix F) discusses the general effects of urbanization on groundwater recharge and the specific effects in the Santa Clarita Valley.

Currently the site is irrigated agricultural land. As a result, in the existing condition recharge occurs within the project site from irrigation and precipitation. On one hand, development of the site will introduce impervious surface over approximately 70 percent of the project site, which will tend to reduce recharge. On the other hand, development of the site will increase runoff volume discharged after treatment to the Santa Clara River, whose channel is predominantly natural and consists of vegetation and coarse-grained sediments (rather than concrete). The porous nature of the sands and gravels forming the streambed will allow for significant infiltration to occur to the underlying groundwater. Also, the project will introduce landscaping, irrigation, and PDFs designed to infiltrate runoff. These project effects will increase groundwater recharge from the Project. On balance, it is unlikely that the project will result in a significant change in groundwater recharge in the project vicinity. Based on the above discussion, the Project's impact on groundwater recharge is considered less than significant.

Cumulative Impacts

Increased urbanization in the Valley has resulted in the irrigation of previously undeveloped lands. The effect of irrigation is to maintain higher soil moisture levels during the summer than would exist if no irrigation were occurring. Consequently, a greater percentage of the fall/winter precipitation recharges groundwater beneath irrigated land parcels than beneath undeveloped land parcels. In addition, urbanization in the Santa Clarita Valley has occurred in part because of the importation of State Water Project (SWP) water, which began in 1980. SWP water use has

increased steadily, reaching nearly 44,500 acre-feet (AF) in 2003. Two-thirds of this water is used outdoors, and a portion of this water eventually infiltrates to groundwater. The other one-third is used indoors and is subsequently routed to local water reclamation plants (WRPs) and then to the Santa Clara River (after treatment). A portion of this water flows downstream out of the basin, and a portion infiltrates to groundwater.

Records show that groundwater levels and the amount of groundwater in storage were similar in both the late 1990s and the early 1980s, despite a significant increase in the urbanized area during these two decades. This long-term stability of groundwater levels is attributed in part to the significant volume of natural recharge that occurs in the streambeds, which do not contain paved, urban land areas. On a long term historical basis, groundwater pumping volumes have not increased due to urbanization, compared with pumping volumes during the 1950s and 1960s when water was used primarily for agriculture. Also, the importation of SWP water is another process that contributes to recharge in the Valley. In summary, urbanization has been accompanied by long-term stability in pumping and groundwater levels, plus the addition of imported SWP water to the Valley, which together have not reduced recharge to groundwater, nor depleted the amount of groundwater that is in storage within the Valley.

Based on the above discussion, the cumulative impact on groundwater recharge is considered less than significant.

7.9 Hydromodification Impacts

Development typically increases impervious surfaces on formerly undeveloped (or less developed) landscapes, reducing the capture and infiltration of rainfall. The result is that, as a watershed develops, a larger percentage of rainfall becomes runoff during any given storm. In addition, runoff reaches the stream channel more efficiently due to the development of storm drain systems, so that the peak discharge rates for rainfall events and floods are higher for an equivalent event than they were prior to development. These changes, in turn, affect the stability of natural drainages, including the physical and biological character of these drainages. This process, termed "hydromodification" (SCCWRP, 2005) is addressed in this section. Significant adverse hydromodification impacts are presumed to occur if the proposed Project would:

- Substantially alter the existing drainage pattern of a natural drainage, stream, or river in a manner that would cause substantial erosion, siltation, or channel instability; or
- Substantially increase the rates, velocities, frequencies, duration and/or seasonality of surface flows in a manner that causes channel instability or in a manner that harms sensitive habitats or species in natural drainages.

The only natural drainage channel that will receive flows from the project site is the Santa Clara River. Therefore this analysis addresses the potential for hydromodification impacts to the Santa Clara River as a result of the proposed project.

7.9.1 Wet Weather Flows

Direct Impacts

The project proposes development that would create impervious surface over approximately 19 percent or 189 acres of the 972 acre total project area. The size of the Project in comparison to both the total watershed area and the expected total impervious area is small. It is estimated, based on the land use data provided by LADPW, that the proposed Project will comprise 0.5 percent of the total impervious area in the watershed above the Project location at ultimate planned build-out for the watershed. See Section 4.4.3 above for information regarding adopted plans and projection used to derive build-out assumptions for the watershed.

The proposed Project includes several hydrologic source controls as hydromodification control PDFs that will substantially lessen any potential hydromodification impacts, as described below. The increase in impervious surface within the project area is expected to increase average annual stormwater runoff volume from the project area by approximately 142 acre-feet per year, taking into account volume reductions expected in the proposed treatment control swales and bioretention areas. Based on these volume increases, increases in stormwater runoff flow rates and duration of flows is expected as a result of the project.

Treatment Controls. The Project's treatment control BMPs will also serve as hydromodification control BMPs. Vegetated swales and extended detention basins can provide volume reduction on the order of 20 to 30 percent through infiltration and evaporation. The Project also includes use of bioretention areas sized to capture and treat 80 percent of the average annual stormwater runoff from its tributary catchment and will not utilize underdrains. Thus, all water captured in these facilities will be effectively removed from the Project's stormwater discharges. Using conservative values for volume reduction, the treatment PDFs included in the Project are estimated to reduce the increase in average annual stormwater runoff volume by approximately 57 acre-feet per year, which is a 19 percent reduction of the predicted average post-development stormwater runoff volume. In addition these facilities will also receive and eliminate dry weather flows.

Site Design Practices. Site design PDFs that help to reduce the increase in runoff volume include routing of roof runoff to vegetated areas, use of native and drought tolerate plants in landscaped areas, the use of efficient irrigation systems in common area landscaped areas, the preservation of 70 percent of the NRSP area in open space, and 55 acres (19 percent) of the Project in open space.

Peak Flow Control. The current Los Angeles County Interim Peak Flow Standard requires that all post development runoff from a 2-year, 24-hour storm not exceed the predevelopment peak flow rate, burned, from a 2-year, 24-hour storm when the predevelopment peak flow rate equals or exceeds five cfs. Peak flow control of 2-year, 24-hour storm event will be achieved through appropriate sizing of the extended detention basin and through runoff volume reduction occurring in the vegetated swales and bioretention areas. Additional storage will be provided via detention in oversized pipes if required. The design and size of the detention pond and pipes and bioretention areas will be finalized during the design stage by the Project engineer as part of the final hydrology study, which will be review and approved by the County of Los Angeles to ensure consistency with this analysis prior to issuance of a final grading permit. Compliance with the interim flow standards has not been quantitatively factored into the calculation of increased surface water runoff anticipated to result from project development, but compliance with these flow standards is qualitatively taken into account in assessing project hydromodification impacts.

Project Conditions. To assure that it complies with any new peak or other design flow standards that may be adopted in the future, the Project will be conditioned to require, as a design feature, sizing and design of the hydraulic features (i.e., oversized pipes) as necessary to control the post-development runoff rates as necessary to meet numeric flow criteria that may be adopted from time to time by the Los Angeles County Department of Public Works under Part 4, § D.1 of the MS4 Permit.

Energy Dissipation. Erosion protection will be provided in the vicinity of proposed outlets for outlet areas where discharges have the potential to cause stream erosion. Erosion protection will be provided at all storm drain outlets to the Santa Clara River.

Bank Stabilization. The Project will include buried soil cement along the Santa Clara River and Castaic Creek adjacent to and downstream of the Project site. In total, approximately 17,700 linear feet (LF) of bank would be provided with buried soil cement protection. This would include approximately 10,900 feet fronting the Project site and approximately 6,800 LF on the south bank adjacent to the Long Canyon Road Bridge. The bank protection along the river will primarily be excavated from non-jurisdictional upland areas adjacent to the river. Installing bank protection in non-jurisdictional areas reduces and/or avoids impacts to the river, allows the river to move within its banks, and has the potential to create new riverbed areas and increase wetland habitat.

In summary, although Project runoff volumes, flow rates, and durations will increase, potential impacts of hydromodification (i.e., the potential to cause erosion, siltation, or channel instability) will be avoided, minimized, and mitigated by the Project PDFs in the following ways:

- Project site design and treatment controls PDFs, especially bioretention areas, will avoid and minimize increases in runoff volume from the development area, the preferred

method for controlling hydromodification impacts from new development (SCCWRP, 2005).

- Concentrated flows will be mitigated with energy dissipators at the discharge points to the Santa Clara River and the River banks will be protected with vegetated buried bank stabilization in non-jurisdictional upland areas adjacent to the river. This type of biostabilization technique is the preferred approach for bank satiation (SCCWRP, 2005).
- The Project will comply with adopted interim standard for control of peak flows from the 50-year capital storm event and the 2-year, 24-hour storm event, or other flow criteria that may be adopted by the Los Angeles County Department of Public Works to meet the Permit requirements for hydromodification control.

For these reasons, the hydromodification impacts of the Project on the Santa Clara River are considered less than significant.

Cumulative Impacts

As discussed above, the Project includes a number of hydrologic source control PDFs that will substantially lessen any potential contribution to cumulative hydromodification impacts to the Santa Clara River. In addition, all future development within the watershed will implement hydromodification controls to meet flow criteria that will be adopted by the LADPW under Part 4, § D.1 of the MS4 Permit. To assure that the Project complies with any new flow standards that may be adopted in the future, the Project will be conditioned to require, as a design feature, design of the hydrologic features to control post-development runoff as necessary to meet flow criteria that may be adopted from time to time under Part 4, § D.1 of the MS4 Permit.

Based on the area of impervious surface proposed, the avoidance and minimization provided by the various hydromodification source controls as Project design features, the fact that the Project will be conditioned to include Project design features to meet future flow control standards established under the MS4 Permit to protect the river from hydromodification impacts, and that future development Projects within the watershed will control flow in compliance with the requirements of the MS4 Permit, the Project's contribution to cumulative hydromodification impacts to the Santa Clara River will be less than significant and consistent with the requirements of the MS4 permit.

7.9.2 Dry Weather Runoff

Direct Impacts

In order to quantitatively address dry weather impacts, a dry weather water balance was performed. The quantity of dry weather flows from urban sources is variable and not easily quantified. Information available from the Irvine Ranch Water District suggests an average dry weather flow from urban areas of 2.9×10^{-4} cfs per urbanized acre (IRWD, 2003). Dry weather flow estimates in Santa Monica, used to design a dry weather flow recycling facility, indicate a

range of dry weather flows between 8.3 x 10^{-5} to 1.8 x 10^{-4} cfs per urbanized acre (Antich et al., 2003). For purposes of conservatively estimating the impacts of dry weather flows, a dry weather discharge of 3.0 x 10^{-4} cfs per urbanized acre was used in this report. Table 7-16 presents a monthly dry weather flow balance for the proposed Project. Swales were assumed to infiltrate at 0.1 in/hr, bioretention areas were assumed to infiltrate at 0.2 in/hr, and water quality basins were assumed to infiltrate at 0.05 in/hr. Evapotranspiration rates were conservatively assumed to be 60% of reference rates from CIMIS Zone 14, in which the Project is located. It was assumed that open space in the Project area would result in no dry weather runoff discharged to the Santa Clara River.

Table 7-15: Predicted Dry Weather Water Balance

Month	Dry Weather Flow (af)[1]	ETo (af)[2]	Infiltration (af)[3]	Outflow (af)
January	5.89	0.80	5.09	0.00
February	5.32	1.16	4.16	0.00
March	5.89	1.92	3.97	0.00
April	5.70	2.64	3.06	0.00
May	5.89	3.53	2.36	0.00
June	5.70	4.04	1.66	0.00
July	5.89	4.49	1.40	0.00
August	5.89	4.01	1.88	0.00
September	5.70	2.95	2.75	0.00
October	5.89	2.09	3.80	0.00
November	5.70	1.09	4.61	0.00
December	5.89	0.80	5.09	0.00

[1] Based on dry weather flow of 0.0003 cfs/acre from a range of researched values.
[2] 60% of Reference ETo from CIMIS Zone 14.
[3] Equal to dry weather runoff up to maximum of .2 in/hr for bioretention, .1 in/hr for swales and .05 in/hr for water quality basins.

It is predicted that all dry weather flows will be infiltrated or removed by evapotranspiration in the Project area water quality PDFs, which also provide hydrologic source control.

Based on comprehensive site planning, source control, and treatment control strategy and the above water balance analysis, the potential for dry weather flows to result in hydromodification or associated habitat or water quality impacts is considered less than significant.

8 CONCLUSIONS

This section summarizes the potential effects, if any, of the proposed Landmark Village Project on water quality and hydromodification in Santa Clara River Reach 7_E.

8.1 Water Quality Impacts

The following are the conclusions regarding the significance of impacts for the pollutants of concern under wet and dry weather conditions:

- ***Sediments*:** MS4 Permit, General Construction Permit, Dewatering General Permit, and SUSMP-compliant BMPs will be incorporated into the Project to address sediment in both the construction phase and post-development. Mean total suspended solids concentration and load are predicted to be less in the post-development condition than in the existing conditions. Turbidity in stormwater runoff will be controlled through implementation of a Construction SWPPP and will be permanently reduced through the stabilization of erodible soils with development. On this basis, the impact of the Project on sediments is considered less than significant.

- ***Nutrients (Phosphorus and Nitrogen (Nitrate+Nitrite-N and Ammonia-N))***: MS4 Permit, General Construction Permit, Dewatering General Permit, and SUSMP-compliant BMPs will be incorporated into the Project to address nutrients in both the construction phase and post-development. Nitrate-nitrogen plus nitrite-nitrogen concentrations and loads are predicted to decrease in the post-developed condition. Total phosphorus concentration is predicted to decrease in post-development conditions and to be below the minimum observed value in the Santa Clara River. Nitrate-N plus nitrite-N and ammonia-N concentrations are predicted to decrease with development to a point well below LA Basin Plan objectives and below or in the low range of observed values in the Santa Clara River Reach 7_E. The predicted nutrient concentrations are not expected to cause increased algae growth. On this basis, the impact of the Project on nutrients is considered less than significant.

- ***Trace Metals*:** MS4 Permit, General Construction Permit, General Dewatering Permit, and SUSMP-compliant BMPs will be incorporated into the Project to address trace metals in both the construction phase and post-development. The mean loads of dissolved copper and dissolved zinc are predicted to increase with Project development, while all trace metal concentrations and the mean load of total lead are predicted to decrease. Mean concentrations of dissolved copper, total lead, and dissolved zinc are below benchmark Basin Plan objectives and CTR criteria. Cadmium is not expected to be present in runoff discharges from the Project. On this basis, the impact of the Project on trace metals is considered less than significant.

- ***Pesticides*:** Pesticides in runoff may or may not increase in the post-development phase as a result of landscape applications. Proposed pesticide management practices, including source control, removal with sediments in treatment control PDFs, and advanced irrigation controls, in compliance with the requirements of the MS4 Permit and the SUSMP will minimize the presence of pesticides in runoff. During the Construction phase of the Project, erosion and sediment control BMPs implemented per General Permit and General De-Watering Permit

requirements will prevent pesticides associated with sediment from being discharged. Final site stabilization will limit mobility of legacy pesticides that may be present in pre-development conditions. On this basis, the impact of the Project on pesticides is considered less than significant.

- ***Pathogens*:** Post-development pathogen sources include both natural and anthropogenic sources. The natural sources include bird and mammal excrement. Anthropogenic sources include leaking septic and sewer systems and pet wastes. A reduction in open space within the Project area will reduce the bacteria produced by wildlife. The Project will not include septic systems and the sewer system will be designed to current standards which minimizes the potential for leaks. Thus pet wastes are the primary source of concern. The PDFs will include source controls and treatment controls which in combination should help to reduce pathogen indicator levels in post-construction stormwater runoff. Pathogens are not expected to occur at elevated levels during the construction-phase of the Project. On this basis, the Projects impact on pathogen and pathogen indicators is considered less than significant.

- ***Hydrocarbons*:** Hydrocarbon concentrations will likely increase in post-development because of vehicular emissions and leaks. In stormwater runoff hydrocarbons are often associated with soot particles that can combine with other solids in the runoff. Such materials are subject to treatment in the proposed infiltration basins and vegetated swales. Source control BMPs incorporated in compliance with the MS4 Permit and the SUSMP requirements will also minimize the presence of hydrocarbons in runoff. During the Construction phase of the Project, pursuant to the General Construction Permit, the Construction Stormwater Pollution Prevention Plan must include BMPs that address proper handling of petroleum products on the construction site, such as proper petroleum product storage and spill response practices, and those BMPs must effectively prevent the release of hydrocarbons to runoff per the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology standards. On this basis, the impact of the Project on hydrocarbons is considered less than significant.

- ***Trash and debris*:** Trash and debris in runoff are likely to increase in post-development if left unchecked. However, the Project PDFs, including source control and treatment BMPs incorporated in compliance with the MS4 Permit and the SUSMP requirements, will minimize the adverse impacts of trash and debris. Source controls such as street sweeping, public education, fines for littering, covered trash receptacles, and storm drain stenciling are effective in reducing the amount of trash and debris that is available for mobilization during wet weather. Trash and debris will be captured in catch basin inserts in the commercial area parking lot and in the treatment control PDFs. During the Construction phase of the Project, PDFs implemented per General Permit and General De-Watering Permit requirements will remove trash and debris through the use of BMPs such as catch basin inserts and by general good housekeeping practices. Trash and debris are not expected to significantly impact receiving waters due to the implementation of the Project PDFs.

- ***Chloride*:** MS4 Permit, General Construction Permit, Dewatering General Permit, and SUSMP-compliant BMPs will be incorporated into the Project to address chloride in both the construction phase and post-development. The mean concentration and load of chloride is predicted to decrease with development, the predicted concentration is well below the LA Basin Plan objective and is near the low range of observed values in the Santa Clara River Reach 7_E. On this basis, the impact of the Project on chloride is considered less than significant.

- ***Methylene Blue Activated Substances (MBAS):*** In the post-development phase, the presence of soap in runoff from the Project will be controlled through the source control PDFs, including a public education program on residential and charity car washing and the provision of a centralized car wash area directed to sanitary sewer in the multi-family residential areas. Other sources of MBAS, such as cross connections between sanitary and storm sewers, are unlikely given modern sanitary sewer installation methods and inspection and maintenance practices. During the construction phase of the Project, equipment and vehicle washing will not use soaps or any other MBAS sources. Therefore, MBAS are not expected to significantly impact the receiving waters of the proposed Project.

- ***Bioaccumulation*:** In the literature, the primary pollutants that are of concern with regard to bioaccumulation are mercury and selenium. However, selenium and mercury are not of concern in this watershed, so bioaccumulation of selenium and mercury is also not expected to result either during the construction or post-development Project phases. On this basis, the potential for bioaccumulation in the Project PDFs or in the Santa Clara River and adverse effects on waterfowl and other species is considered less than significant.

- ***Construction Impacts:*** Construction impacts on water quality are generally caused by soil disturbance and subsequent suspended solids discharge. These impacts will be minimized through implementation of construction BMPs that will meet or exceed measures required by the General Construction Permit, as well as BMPs that control the other potential construction-related pollutants (PAHs, metals). A SWPPP will be developed as required by, and in compliance with, the General Construction Permit and City of Santa Clarita Standard Conditions. Erosion control BMPs, including but not limited to hydro-mulch, erosion control blankets, and energy dissipators will be implemented to prevent erosion, whereas sediment controls, including but not limited to silt fence, sedimentation ponds, and secondary containment on stockpiles will be implemented to trap sediment once it has been mobilized. On this basis, the construction-related impact of the Project on water quality is considered less than significant.

- ***Regulatory Requirements:*** The proposed Project satisfies MS4 Permit requirements for new development, including SUSMP requirements and SQMP requirements, and satisfies construction-related requirements of the General Construction Permit and General

Dewatering Permit, and therefore complies with water quality regulatory requirements applicable to stormwater runoff.

8.2 Groundwater Impacts

- ***Groundwater Quality Impacts (Nitrate+Nitrite-N)***: MS4 Permit, General Construction Permit, Dewatering General Permit, and SUSMP-compliant BMPs will be incorporated into the Project to address nutrients in both the construction phase and post-development. Nitrate-nitrogen plus nitrite-nitrogen concentrations are predicted to decrease in the post-developed condition. The predicted nitrate-nitrogen plus nitrite-nitrogen concentration in stormwater runoff after treatment in the Project PDFs and in irrigation water is well below the groundwater quality objective. On this basis, the potential for adversely affecting groundwater quality is considered less than significant.

- ***Groundwater Recharge Impacts***: Stormwater runoff from the Project will be discharged to the Santa Clara River after treatment, whose channel is predominantly natural and consists of vegetation and coarse-grained sediments (rather than concrete). The porous nature of the sands and gravels forming the streambed will allow for significant infiltration to occur to the underlying groundwater. Also, irrigation water is predicted to be fully infiltrated during dry weather, which will increase groundwater recharge from the Project. On this basis, the Project's impact on groundwater recharge is considered less than significant

8.3 Hydromodification Impacts

The following are the conclusions regarding the significance of impacts for hydromodification impacts under wet- and dry-weather conditions:

- ***Wet Weather Project Impacts:*** potential impacts of hydromodification (i.e., the potential to cause erosion, siltation, or channel instability) will be controlled by the Project PDFs in the following ways:

  - Project site design and treatment controls PDFs, especially bioretention areas, will reduce the runoff volume from the development area.
  - Localized effects of concentrated flows will be mitigated with energy dissipators at the discharge points to the Santa Clara River and the river banks will be protected with buried bank stabilization in non-jurisdictional upland areas adjacent to the river.
  - The Project will comply with adopted interim standard for control of peak flows from the 50-year capital storm event and the 2-year, 24-hour storm event, or other flow criteria that may be adopted by the Los Angeles County Department of Public Works to meet the Permit requirements for hydromodification control.

For these reasons, direct hydromodification impacts of the Project on the Santa Clara River are considered less than significant.

- ***Cumulative Hydromodification Impacts:*** The Project contributes only 0.5% of total potential impervious surface at build out within the watershed, the Project includes hydromodification source controls as Project design features, the Project will be conditioned to include Project design features to meet future flow control standards established under the MS4 Permit to protect the river from hydromodification impacts, and future development Projects within the watershed will control flow in compliance with the regional program. Therefore, the Project's contribution to cumulative hydromodification impacts to the Santa Clara River will be less than significant and consistent with the requirements of the MS4 permit.

- ***Dry Weather Hydromodification Impacts:*** Due to the proposed comprehensive site planning, source control, and treatment control strategy, it is predicted that all dry weather flows will be infiltrated or removed by evapotranspiration in the Project's treatment control BMPs. Low flows are unlikely to be discharged, preventing hydromodification from habitat conversion and other effects of dry weather runoff.

The proposed Project will not substantially alter the existing drainage pattern of the Santa Clara River in a manner that would cause substantial erosion, siltation, or channel instability; or substantially increase the rates, velocities, frequencies, duration and/or seasonality of flows in a manner that causes channel instability or in a manner that harms sensitive habitats or species in the river. Therefore, the impact of the Project on hydromodification is considered less than significant.

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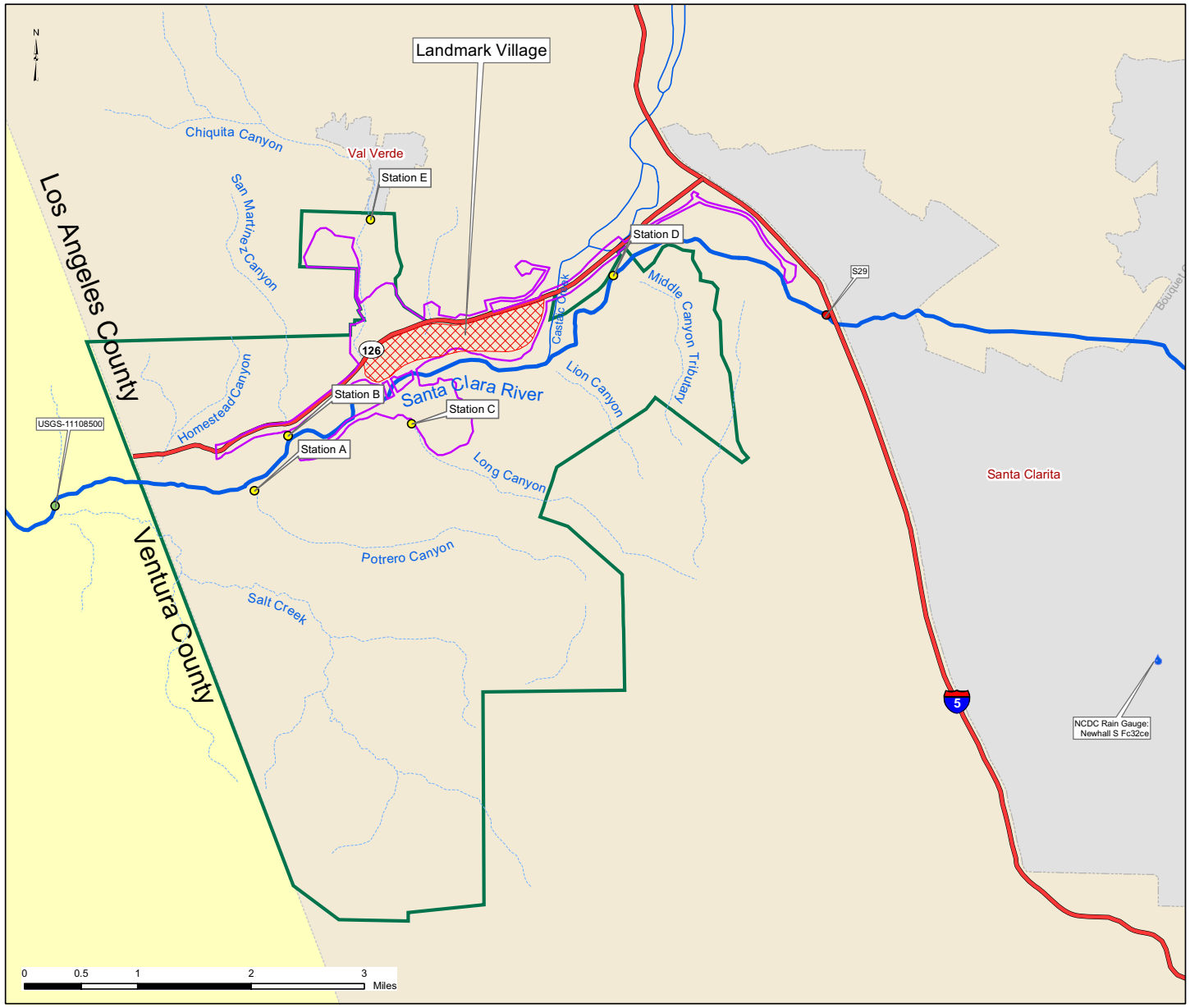

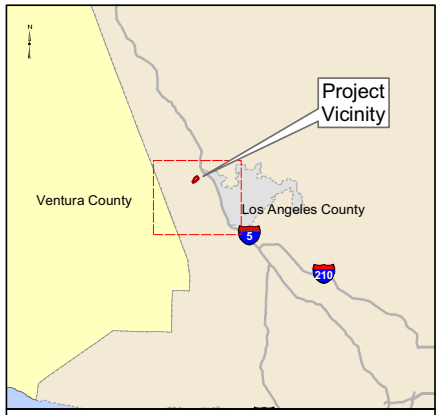

Legend

- Impact Boundary
- Rain Gage

Monitoring Stations

- LACDPW Gauge
- USGS Gauge
- NR Stations
- Rivers and Streams
- Water Bodies
- City Boundaries
- Los Angeles County
- Ventura County
- National Forest
- Newhall Ranch Specific Plan
- Landmark Village

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Figure 2-1:
Project Location Map

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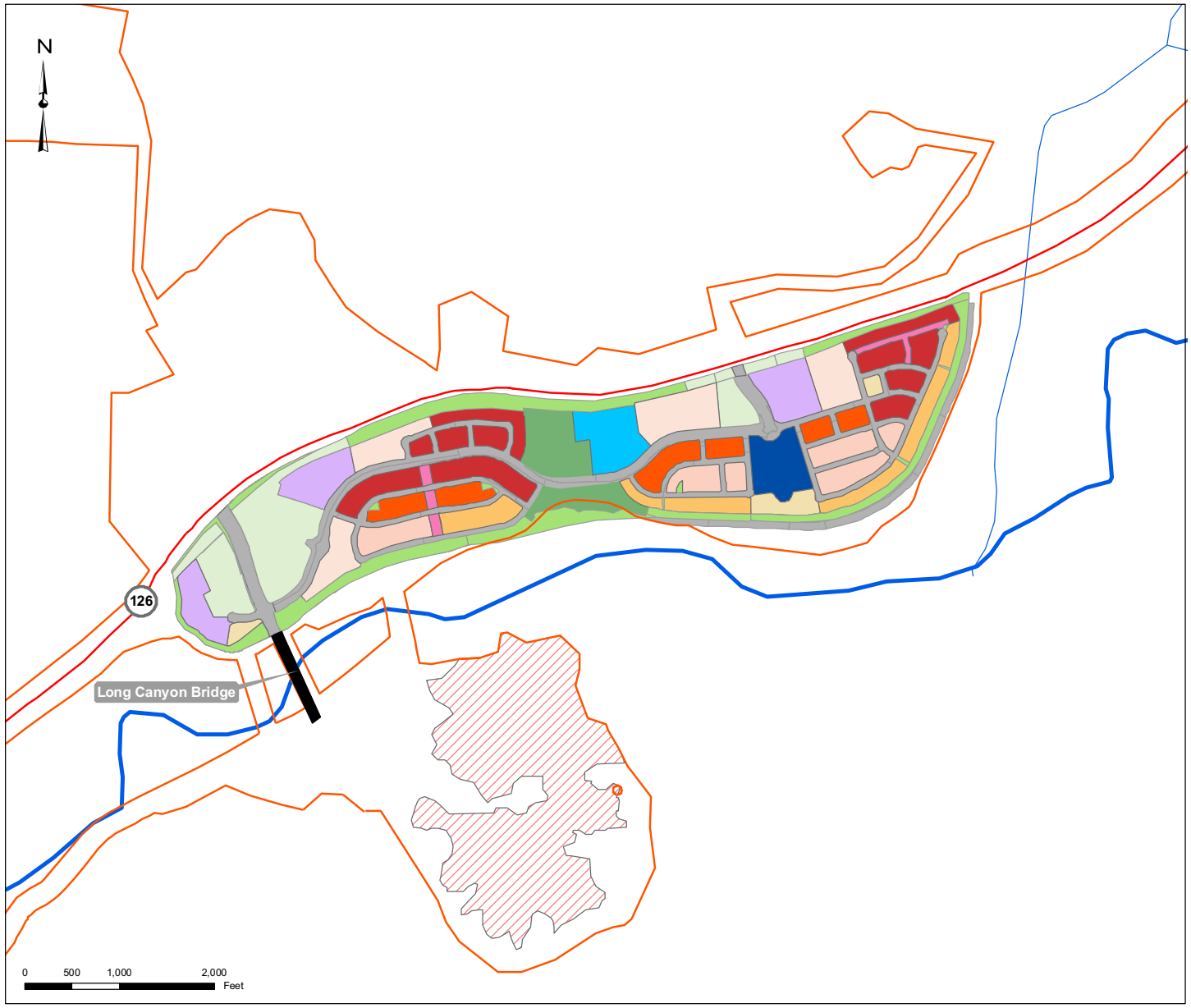

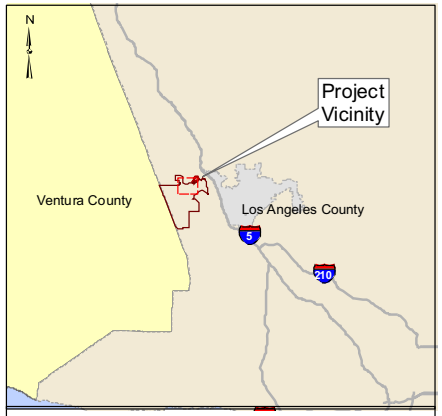

Legend

- Impact Boundary

LAND USES

- 45' x 105' (Res)
- 55' x 105' (Res)
- 60' x 105' (Res)
- Apartment
- Attached Condo
- Detached Condo
- Private Drive
- Mixed Use / Condo
- Mixed Commercial Use
- Open Space
- Park
- Recreation
- Public Drive
- School
- Water Bodies
- City Boundaries
- Borrow Sites

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Figure 2-2:
Project Land Uses

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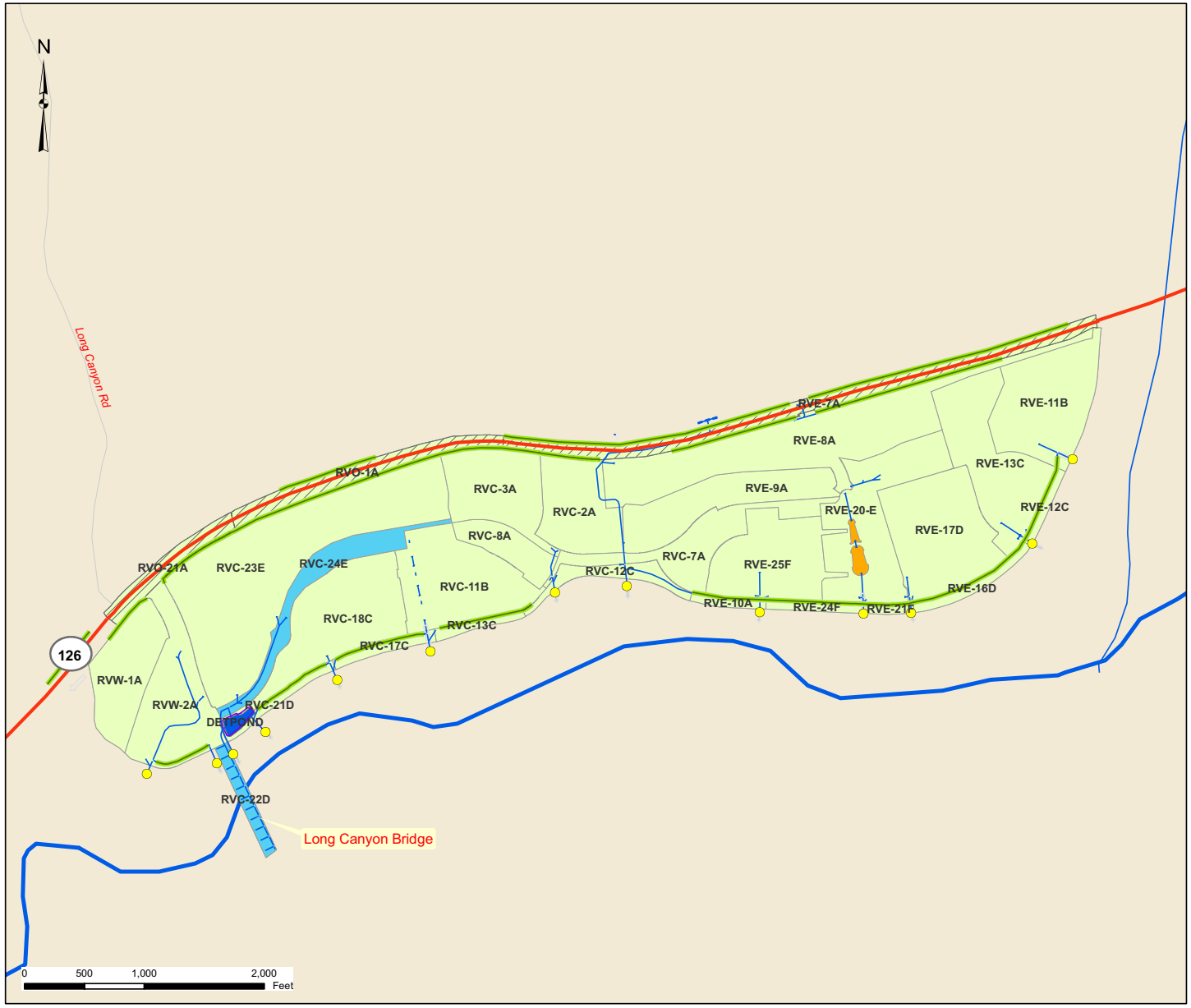

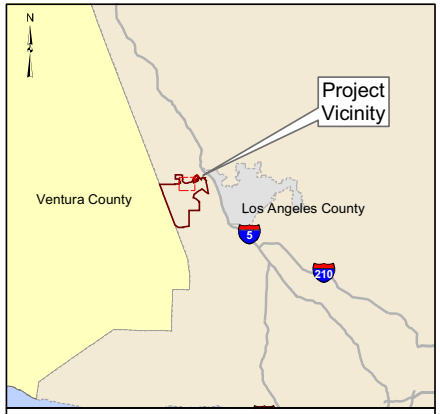

Legend

- Water Bodies
- City Boundaries
- Areas Treated By Bioretention
- Areas Treated By Water Quality Basin
- Areas Treated By Vegetated Swale
- Water Quality Basin
- Vegetated Swale
- Storm Drain Outfall
- SR126 Project Boundary

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Figure 5-1:
Treatment Areas

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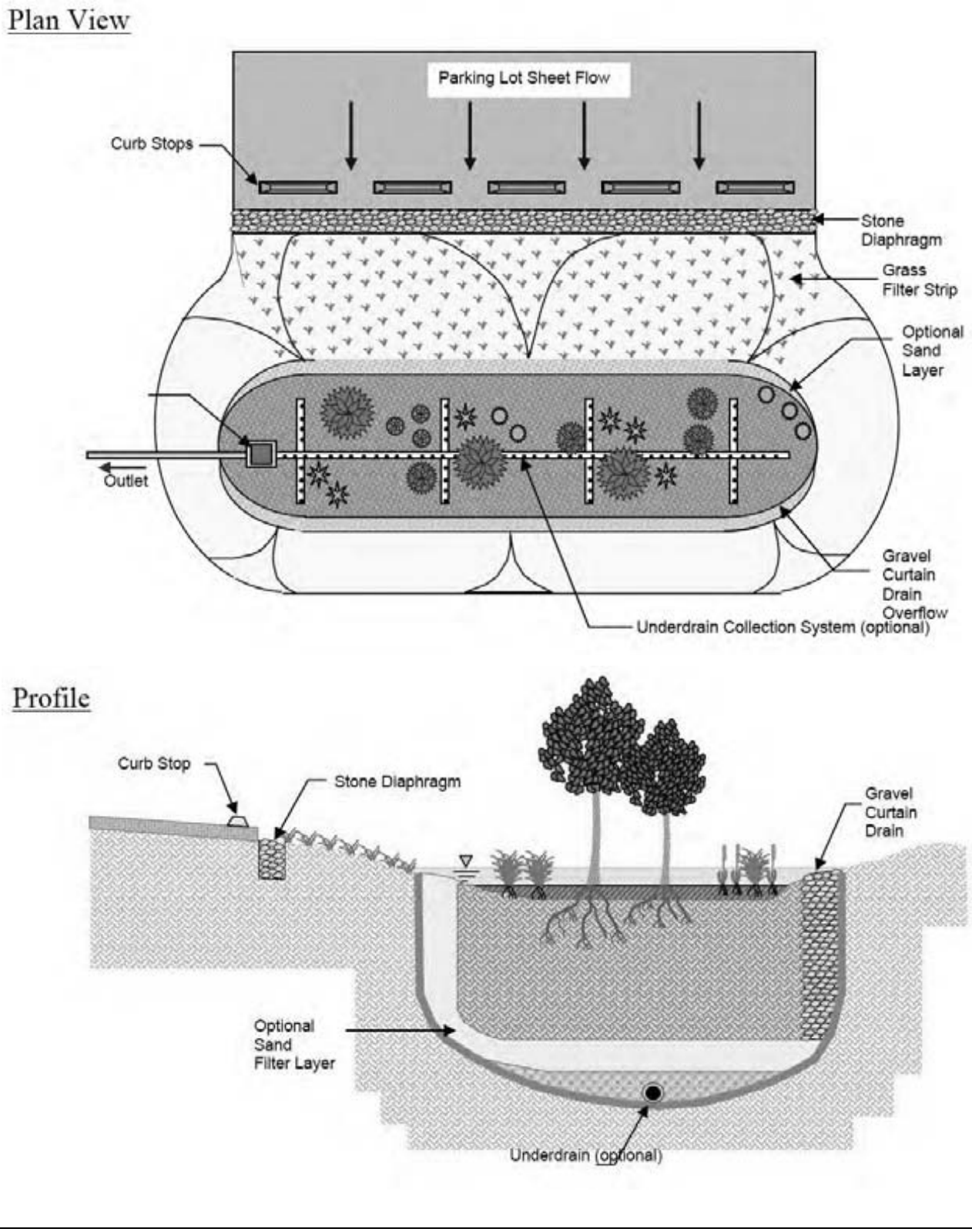

Figure 5-2
Conceptual Illustration of a Bioretention Facility

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Figure 5-3
Examples of Bioretention Facilities

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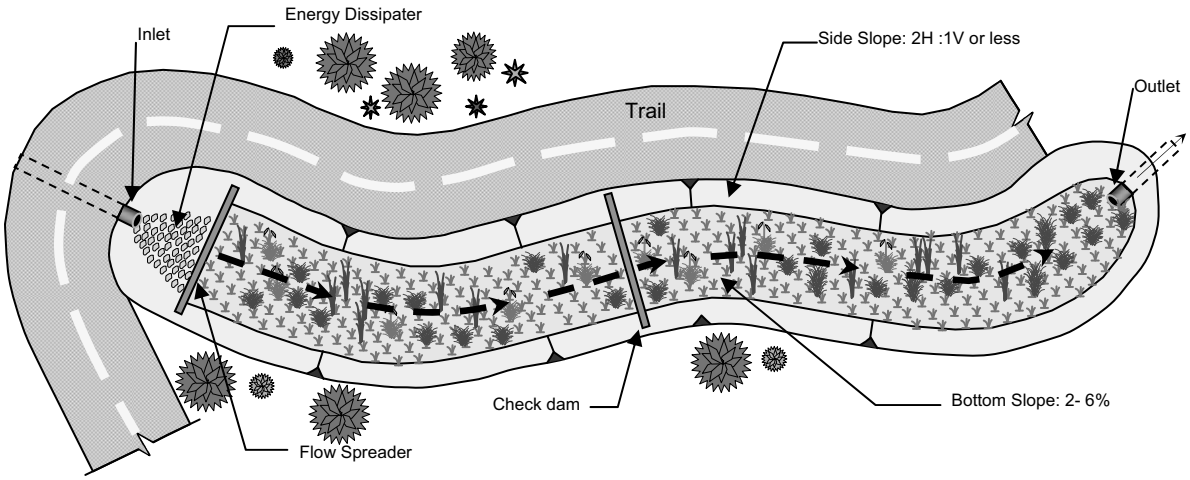
Plan View



Profile

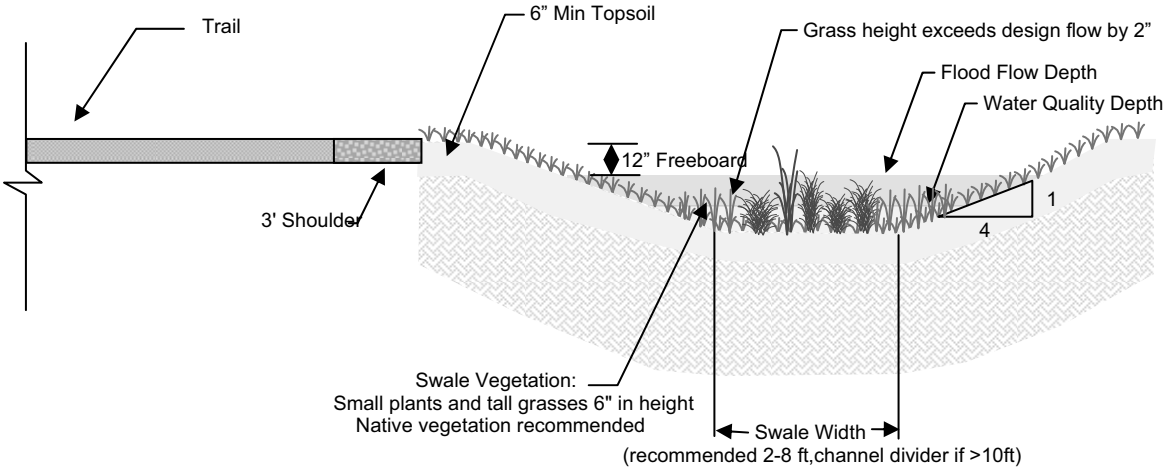


Figure 5- 4
Conceptual Illustration of a Vegetated Swale

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Figure 5-5
Examples of Vegetated Swales

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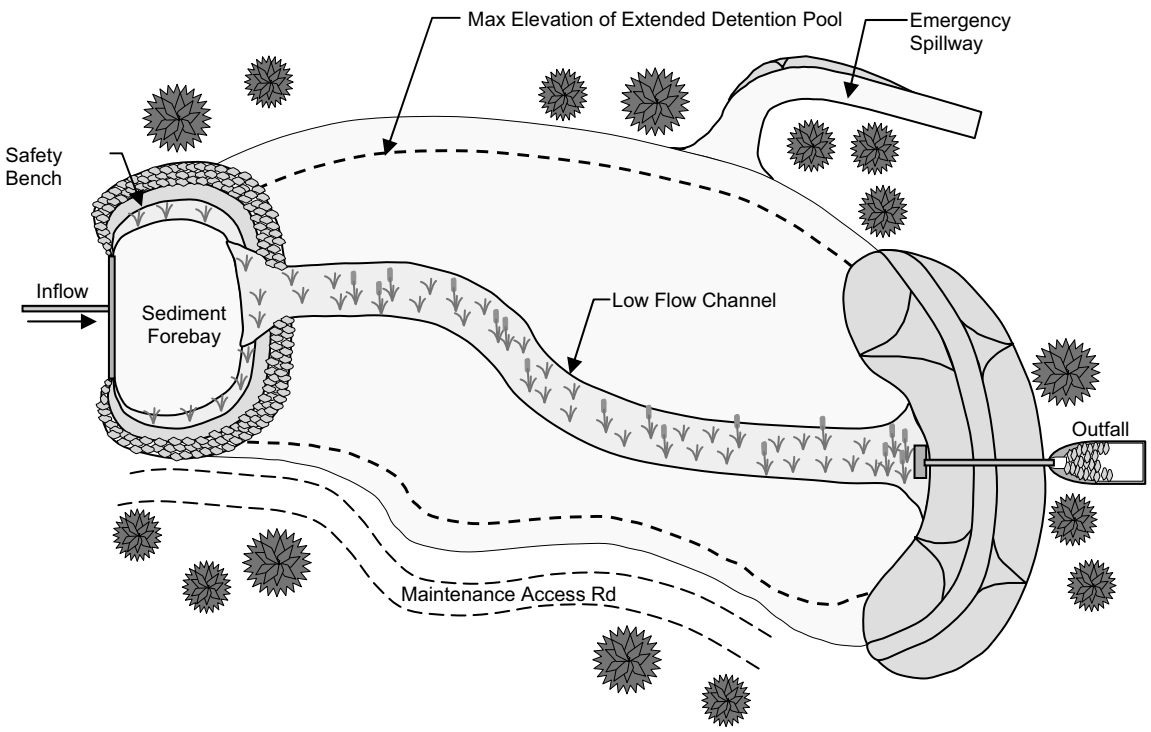
Plan View



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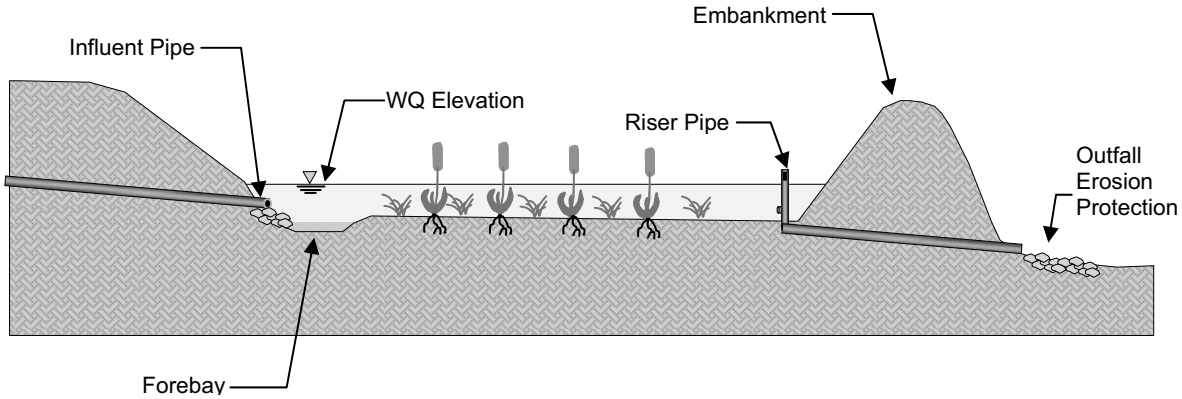

Figure 5-6
Conceptual Illustration of a Water Quality Basin

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Figure 5-7
Examples of Water Quality Basins

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Landmark Village Water Quality Technical Report
Appendices

(A) Pollutants of Concern

(B) Modeling Parameters & Methodology

(C) BMP Sizing Criteria

(D) Newhall Ranch Stormwater Monitoring Data

(E) Los Angeles Unified School District Integrated Pest Management Plan

(F) Review of Bacteria Data from Southern California Watersheds

(G) Effect of Urbanization on Groundwater Recharge in the Santa Clarita Valley

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A. APPENDIX A: POLLUTANTS OF CONCERN

A.1. Pollutants of Concern

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
Sediment: Total Suspended Solids (TSS) & Turbidity	1. "Sediment is a common component of stormwater, and can be a pollutant. Sediment can be detrimental to aquatic life (primary producers, benthic invertebrates, and fish) by interfering with photosynthesis, respiration, growth, reproduction, and oxygen exchange in water bodies. Sediment can transport other pollutants that are attached to it including nutrients, trace metals, and hydrocarbons. Sediment is the primary component of total suspended solids (TSS), a common water quality analytical parameter." (CSQA, 2003)	1. Narrative objective in the LA Basin Plan: "Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses." 2. LA Basin Plan objective for turbidity: "Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: Natural Turbidity — Max Increase 0-50 NTU — 20% > 50 NTU — 10% Allowable zones of dilution within which higher concentrations may be tolerated may be defined for each discharge in specific Water Discharge Requirements."
Nutrients: Ammonia, Nitrite, Nitrate, Total Nitrogen, and Total Phosphorus	1. "Nutrients including nitrogen and phosphorous are the major plant nutrients used for fertilizing landscapes, and are often found in stormwater. These nutrients can result in excessive or accelerated growth of vegetation, such as algae, resulting in impaired use of water in lakes and other sources of water supply. For example, nutrients have led to a loss of water clarity in Lake Tahoe. In addition, un-ionized ammonia (one of the nitrogen forms) can be toxic to fish." (CSQA, 2003). 2. Nutrients are a biostimulatory substance.	1. LA Basin Plan standards for ammonia: "In order to protect aquatic life, ammonia concentrations in receiving waters shall not exceed the values listed for the corresponding in-stream conditions in Tables 3-1 to 3-4." The criterion for ammonia varies with pH and temperature; the criterion is lower for lower pH and temperature. The basin plan amendment for updated ammonia standards (dated 04/02, effective July 15, 2003) will be used. 2. LA Basin Plan standards for nitrogen: "Waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen (NO_3-N + NO_2-N), 45 mg/L as nitrate (NO_3), 10 mg/L as

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
		nitrate-nitrogen (NO_3-N), or 1 mg/L as nitrite-nitrogen (NO_2-N) or as otherwise designated in Table 3-8." Table 3-8 lists Reach 5 of the Santa Clara River Reach 5 with a water quality objective of 5 mg/L nitrate-N + nitrite-N. 3. Reaches 5 and 7 (EPA Reaches 7 and 9) of the Santa Clara River is listed as having ground water recharge as a beneficial use in the LA Basin Plan. LA Basin Plan standards for nitrogen: "Ground waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen (NO_3-N + NO_2-N), 45 mg/L as nitrate (NO_3), 10 mg/L as nitrate-nitrogen (NO_3-N), or 1 mg/L as nitrite-nitrogen (NO_2-N)." 4. Resolution 03-011 (LARWQCB, 08/2003) promulgates water quality objectives (TMDLs) for Reach 5 (EPA Reach 7) of the Santa Clara River of 2.0 mg/L ammonia-N (1.2 mg/L at County line) and 4.5 mg/L as NO_3-N + NO_2-N. 5. Narrative objective for biostimulatory substances in the LA Basin Plan: "Waters shall not contain biostimulatory substances in concentrations that promote algal growth to the extent that such growth causes nuisance or adversely affects beneficial uses."
Trace metals: Copper, Lead, Zinc, Arsenic, Cadmium, Chromium, Mercury, and Nickel	1. "Metals including lead, zinc, cadmium, copper, chromium, and nickel are commonly found in stormwater. Many of the artificial surfaces of the urban environment (e.g., galvanized metal, paint, automobiles, or preserved wood) contain metals, which enter stormwater as the surfaces corrode, flake, dissolve, decay, or leach. Over half the trace metal load carried in stormwater is associated with sediments. Metals are of concern	1. Narrative objective in the LA Basin Plan: "All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. …" 2. The CTR criteria are the applicable water quality objectives for protection of aquatic life (40 CFR 131.38). The CTR criteria are expressed for acute and chronic (4-

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
	because they are toxic to aquatic organisms, can bioaccumulate (accumulate to toxic levels in aquatic animals such as fish), and have the potential to contaminate drinking water supplies." (CSQA, 2003) 2. LA Basin Plan requires that discharges into receiving waters shall not cause or contribute to toxicity. 3. Urban development can increase potential sources of these metals due to sources from vehicles and building materials.	day average) conditions; however, only acute conditions are applicable for stormwater discharges because the duration of stormwater discharge is typically less than 4 days. 3. CTR criteria are expressed for dissolved metal concentrations and are determined on the basis of hardness in the receiving water. In application of criteria to the Project, local hardness data will be used to determine most appropriate criteria.
Chloride	1. Resolution R03-008 Amendment to the Water Quality Control Plan (Basin Plan) for the Los Angeles Region to Incorporate a Total Maximum Daily Load for Chloride in the Upper Santa Clara River (07/03) states "Elevated chloride concentrations are causing impairments of the water quality objective in Reach 5 (EPA 303(d) list Reach 7) and Reach 6 (EPA 303(d) list Reach 8) of the Santa Clara River. This objective was set to protect all beneficial uses; agricultural beneficial uses have been determined to be most sensitive, and not currently attained at the downstream end of Reach 5 (EPA 303(d) list Reach 7) and Reach 6 (EPA 303(d) list Reach 8) in the Upper Santa Clara River. Irrigation of salt sensitive crops such as avocados and strawberries with water containing elevated levels of chloride results in reduced crop yields. Chloride levels in groundwater are also rising."	1. LA Basin Plan contains mineral objectives for individual inland surface waters. Reach 5 of the Santa Clara River has a chloride objective of 100 mg/L. 2. Resolution R03-008 states "The numeric target for this TMDL pertains to Reaches 5 and 6 of the Santa Clara River and is based on achieving the existing water quality objective of 100 mg/L, measured instantaneously, throughout the impaired reaches."

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
Pathogens (Fecal Coliform, Viruses, and Protozoa)	1. "Bacteria and viruses are common contaminants of stormwater. For separate storm drain systems, sources of these contaminants include animal excrement and sanitary sewer overflow. High levels of indicator bacteria in stormwater have led to the closure of beaches, lakes, and rivers to contact recreation such as swimming." (CSQA, 2003) 2. Fecal coliform is a frequently monitored indicator organism of human pathogens. 3. Human related activities can increase fecal coliform concentrations. 4. Concentrations of fecal coliform in stormwater can be elevated, often due in part to the presence of coliform bacteria from natural sources.	1. LA Basin Plan objectives are based on the designated uses of the water body. The Santa Clara River Reach 5 is listed with a REC1 beneficial use. Resolution # 01-018 (LARWQCB, 2001) amended the LA Basin Plan standards for bacteria in waters with a contact recreation beneficial use. These standards for freshwaters are Geometric Mean / Single Sample E. coli: ≤ 126/100 ml / ≤ 235/100 ml fecal coliform: ≤ 200/100 ml / ≤ 400/100 ml
Pesticides	1. "Pesticides (including herbicides, fungicides, rodenticides, and insecticides) have been repeatedly detected in stormwater at toxic levels, even when pesticides have been applied in accordance with label instructions. As pesticide use has increased, so too have concerns about adverse effects of pesticides on the environment and human health. Accumulation of these compounds in simple aquatic organisms, such as plankton, provides an avenue for biomagnification through the food web, potentially resulting in elevated levels of toxins in organisms that feed on them, such as fish and birds." (CSQA, 2003) 2. Pesticides loads may be present in runoff from developed areas due to pesticide use for urban landscaping.	1. Narrative objective in the LA Basin Plan: "Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the limiting concentrations specified in … Title 22 of the California Code of Regulations …." The LA Basin Plan contains maximum contaminant levels for a range of pesticides. 2. CTR lists numeric objectives for some, but not all pesticides. There are no CTR criteria for diazinon and chlorpyrifos, but these substances are now banned from most urban uses.

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
Petroleum Hydrocarbons: Oil & Grease and Polycyclic Aromatic Hydrocarbons (PAHs)	1. "Oil and grease includes a wide array of hydrocarbon compounds, some of which are toxic to aquatic organisms at low concentrations. Sources of oil and grease include leakage, spills, cleaning and sloughing associated with vehicle and equipment engines and suspensions, leaking and breaks in hydraulic systems, restaurants, and waste oil disposal." (CSQA, 2003) 2. Petroleum hydrocarbons are ubiquitous, and used in a wide variety of applications. Potential sources are generally expected to increase with urban development. 3. A source of PAHs is automobile exhaust. Therefore, development would generally be expected to increase levels of PAHs.	1. Narrative objective in the LA Basin Plan for oil & grease: "Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance or that otherwise adversely affect beneficial uses." 2. PAHs are a class of compounds. CTR values for individual PAHs are available for protection of human health only. There are no regulatory standards for the protection of aquatic health.
Bioaccumulation & Toxicity	1. Some Pollutant of concern in stormwater runoff such as metals or pesticides have the potential to bioaccumulate in aquatic organisms potentially affecting the health of those organism or other species higher up the food chain. 2. Certain pollutants in stormwater runoff have the potential to be highly toxic to aquatic organisms resulting in effects such as impaired reproduction or mortality.	1. Toxic pollutants shall not be present at levels that will bioaccumulate in aquatic life to levels which are harmful to aquatic life or human health. 2. LA Basin Plan objectives for toxicity: "All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life."

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
Trash and Debris	1. "Gross Pollutants (trash, debris, and floatables) may include heavy metals, pesticides, and bacteria in stormwater. Typically resulting from an urban environment, industrial sites and construction sites, trash and floatables may create an aesthetic "eye sore" in waterways. Gross pollutants also include plant debris (such as leaves and lawn-clippings from landscape maintenance), animal excrement, street litter, and other organic matter. Such substances may harbor bacteria, viruses, vectors, and depress the dissolved oxygen levels in streams, lakes, and estuaries sometimes causing fish kills." (CSQA, 2003)	1. LA Basin Plan narrative floating material objective: "Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause a nuisance or adversely affect beneficial uses."
Oxygen, Dissolved & BOD (Biochemical oxygen demand)	1. Adequate DO levels are required to support aquatic life. Depressed levels may lead to anaerobic conditions. 2. BOD can result in decreased dissolved oxygen levels affecting beneficial uses such as habitat designations. 3. DO & BOD are correlated to nutrients and other organic compounds and are subsumed by those categories.	1. LA Basin Plan objective for dissolved oxygen: "The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges." 2. LA Basin Plan objective for BOD: "Waters shall be free of substances that result in increases in the BOD which adversely affect beneficial uses."
Biostimulatory substances	1. Biostimulatory substances include excess nutrients and other compounds that stimulate aquatic growth resulting in impaired aesthetics and water quality impairments such as lowered dissolved oxygen values. 2. Biostimulatory substances are correlated to nutrients and other organic compounds and are subsumed by those categories.	1. LA Basin Plan objectives for biostimulatory substances: "Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance of adversely affects beneficial uses."

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
Chemical Pollutants	3. Chemical Pollutants in excessive amounts in drinking water are harmful to human health. 4. The chemical Pollutants referenced under this water quality objective, such as trace metals and nitrate are either subsumed by the categories above, or are not found in urban runoff (e.g., fluoride).	2. LA Basin Plan objectives for chemical Pollutants: "Surface waters shall not contain concentrations of chemical Pollutants in amounts that adversely affect any designated beneficial use."
Temperature	1. Elevated temperatures are typically associated with discharges of process wastewaters or non-contact cooling waters. Increase in temperature can result in lower dissolved oxygen levels impairing habitat and other beneficial uses of receiving waters. Stormwater runoff from the Project site is expected to cool somewhat during treatment in structural BMPs and will be diluted in the receiving water. As the beneficial uses in the receiving waters for the Project include warm freshwater habitat to support warm water ecosystems, any increase in temperature resulting from stormwater runoff from the project is expected to be less than significant.	1. LA Basin Plan objectives for temperature: "For waters designated WARM, water temperature shall not be altered by more than 5º F above the natural temperature. At no time shall these WARM-designated waters be raised above 80 º F as a result of waste discharges".
Total Residual Chlorine	1. Municipal pools and private pools in areas served by a municipal sanitary system are required to be discharged into the sanitary system. Chlorine disinfection will not take place on the project site and there will not be any sources of elemental chlorine. Chloride sources (e.g. fertilizers or other compounds with salts) are evaluated separately. Therefore, total residual chlorine will not be present in runoff from the project.	1. LA Basin Plan objectives for total residual chlorine: "Chlorine residual shall not be present in surface water discharges at concentrations that exceed 0.1 mg/L and shall not persist in receiving waters at any concentration that causes impairment for beneficial uses".

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
Color, Taste, and Odor	1. Undesirable tastes and odors in water may be a nuisance and may indicate the presence of a pollutant(s). Odor associated with water can result from decomposition of organic matter or the reduction of inorganic compounds, such as sulfate. Other potential sources of odor causing substances, such as industrial processes, will not occur as part of the project. Color in water may arise naturally, such as from minerals, plant matter, or algae, or may be caused by industrial pollutants. 2. The Project will contain no industrial uses. Commercial areas of the project are not expected to be a significant source of Pollutants that might impart color or odor to stormwater flows from the project area. Source controls are expected to reduce the amount of plant material and BMPs will reduce sediment which could contribute to color or odor nuisances. Therefore, color-, taste-, or odor-producing substances are not pollutants of concern for the project.	1. LA Basin Plan objective for color: "Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses". 2. LA Basin Plan objectives for taste and odor: "Ground waters shall not contain taste or odor-producing substances in concentration that cause nuisance or adversely affect beneficial uses".
Exotic Vegetation	1. Exotic vegetation typically provides little habitat value and can out compete native vegetation that is more suitable habitat for aquatic and terrestrial organisms. 2. The landscape management plan will not use exotic vegetation, and undesirable invasive vegetation will be eradicated to the extent possible. Therefore, exotic vegetation is not a pollutant of concern for the Project.	1. LA Basin Plan objective for exotic vegetation: "Exotic vegetation shall not be introduced around stream courses to the extent that such growth causes nuisance or adversely affects designated beneficial uses."

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
Mineral Quality (TDS, Boron, Sulfate, Sodium Absorption Ratio - SAR)	1. LADPW stormwater monitoring data arithmetic mean concentrations for TDS, sulfate, and boron for urban land uses are below the water quality objectives for minerals. Calculated SAR values are 0.6 for SF residential and 1.9 for commercial based on LADPW data. The minerals listed in the Basin Plan, except chloride and nitrogen, are not believed to be Pollutants of concern due to the absence of river impairments and /or anticipated runoff concentrations below the Basin Plan objectives	1. LA Basin Plan objectives for minerals: Reach 5 / Reach 7 TDS (mg/L) 1000 / 800 Sulfate (mg/L) 400 / 150 Boron (mg/L) 1.5 / 1.0 SAR (mg/L) 10 / 5.0
MBAS (Methylene blue activated substances)	1. MBAS are related to presence of detergents in runoff, may be incidentally associated with new urban development, but more commonly with point sources such as treatment plants. The project will have no planned illicit sewer connections or septic tanks, eliminating domestic sources. Further, the project will employ source controls such as educational materials for homeowners regarding elimination of discharges from car washing to the storm drain system, control of construction vehicle wash water, control of construction, street, and pavement washing activities to control wash water. LADPW stormwater monitoring found MBAS concentrations below the water quality criteria for all urban land use except transportation; therefore this Pollutant is not anticipated to be a pollutant of concern for the project.	1. LA Basin Plan objective for MBAS: "Waters shall not have MBAS concentrations greater than 0.5 mg/L in water designated (MUN)."
pH	1. Mean runoff concentrations in the Los Angeles County stormwater monitoring data ranged from 6.5 for mixed- and single-family residential land uses to 7.0 for commercial land use. Therefore, pH in the Santa Clara River is not expected to be affected by runoff discharges from the project.	1. LA Basin Plan objective for pH: "the pH of inland waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0.5 units from natural conditions as a result of waste discharge."

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
PCBs	1. PCBs are highly toxic persistent chemicals that have been historically released into the environment from industrial uses, such as transformers. Due to their persistence, PCBs can still be detected in urban runoff due to historic industrial sources of these chemicals. 2. The project area did not historically include PCB-producing land uses and industrial land uses are not included in the proposed project. Therefore, PCBs are not a pollutant of concern for the project.	1. LA Basin Plan narrative regarding PCBs: "The purposeful discharge of PCBs to waters of the Region, or at locations where the waste can subsequently reach waters of the Region, is Prohibited. Pass-through or uncontrollable discharges to waters of the Region, or at locations where the waste can subsequently reach waters of the Region, are limited to 70 pg/L (30 day average) for protection of human health and 14 ng/L and 30 ng/L (daily average) to protect aquatic life in inland fresh waters and estuarine waters respectively".
Radioactive Substances	1. Some activities such as mining or industrial activities can increase the amount of radioactive substances impairing beneficial uses. 2. The project will not have industrial or other activities that would be a source of any radioactive substances, and development will stabilize any naturally radioactive soils, though unlikely to be present in the project area. Therefore, radioactive substances are not a pollutant of concern for the project.	1. LA Basin Plan narrative objective for radioactive substances: "Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life".

1. Pollutants of concern are those pollutants that are anticipated or potentially could be generated by development that have been identified by regulatory agencies as potentially impairing beneficial uses in the receiving water bodies or that could adversely affect receiving water quality.

A.2. References

California Stormwater Quality Association (CSQA), 2003. *Stormwater Best Management Practices Handbook New Development & Redevelopment*.

Los Angeles Regional Water Quality Control Board, 1995. Water Quality Control Plan Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.

Los Angeles Regional Water Quality Control Board, October, 25th, 2001. Resolution 01-018: Amendment to the Water Quality Control Plan for the Los Angeles Region to Update the Bacteria Objectives for Water Bodies Designated for Water Contact Recreation

Los Angeles Regional Water Quality Control Board, July, 10th, 2003. Resolution R03-008 Revision of interim waste load allocations for chloride in the Amendment to the Water Quality Control Plan for the Los Angeles Region to include a TMDL for Chloride in the Upper Santa Clara River.

Los Angeles Regional Water Quality Control Board, August, 7th, 2003. Resolution R03-011 Amendment to the Water Quality Control Plan for the Los Angeles Region to include a TMDL for Nitrogen Compounds in the Santa Clara River.

US Environmental Protection Agency California Toxics Rule (CTR), 40 C.F.R. §131.38.

B. APPENDIX B: WATER QUALITY MODEL METHODOLOGY

B.1. Model Description

B.1.1. Model Overview

The model used to assess stormwater quality impacts associated with the proposed Newhall Ranch Landmark Village sub-division is an empirical, volume-based, pollutant loads model. This type of loadings model is generally applicable in the planning and evaluation stages of a project. The model was developed to assess the potential impact of development on water quality and to evaluate the effectiveness of the structural Best Management Practices (BMPs) that will treat storm water runoff as part of the project storm water treatment system. Two project conditions were evaluated with the water quality model:

1. Pre-development
2. Post-development with treatment water quality basins

Measured runoff volumes and water quality characteristics of storm water are highly variable. To account for this variability, a statistical modeling approach was used to estimate the volume of storm water, the concentration of pollutants in storm water, and the overall pollutant load (total mass of pollutants) in storm water runoff. A statistical description of storm water provides an indication of the average characteristics and variability of the water quality parameters of storm water, and the probability of compliance with regulatory criteria. It does not forecast runoff characteristics or regulatory compliance for specific storms or monitoring periods.

The statistical model is based on relatively simple expressions describing rainfall/runoff relationships and estimated concentrations in storm water runoff. The volume of storm water runoff is estimated using a modification to the Rational Formula, an empirical expression that relates runoff volume to the rainfall depth and the broad basin characteristics. The pollutant concentration in storm water runoff is represented by an expected average pollutant concentration, called the event mean concentrations (EMC). The EMCs are estimated from available monitoring data from, and are strongly dependent on, the land-use type.

The model does not incorporate the hydraulics or hydrology of the site, which would be more appropriate for design stages and requires additional data and more sophisticated modeling. The model includes water quality benefits achieved by structural BMPs, but not source control BMPs because data is generally not available or inconclusive for the latter. Model results are presented for average annual runoff volumes, pollutant loads, and pollutants concentrations.

As with all environmental modeling, the precision of results is heavily dependent on how well the hydrologic, water quality and BMP effectiveness data describe the actual site characteristics. Local and regional data used to the fullest extent possible helps to minimize errors in predictions. It is important to remember that the predictions of relative differences are also of importance rather than just precision. The ability of errors to propagate and magnify is inherent with this type of model and must be considered when viewing results. An extensive sensitivity analysis is

beyond the scope of this document and therefore errors will only be discussed qualitatively. However, it is important to point out that one of the most variable parameters is the runoff coefficient, which is a function of the percent imperviousness. Novotny and Olem (1994), when discussing the Rational Formula, state "...the runoff coefficient is the most important task of the entire calculation." It is difficult to accurately estimate the percent impervious, especially for projects in the planning phase.

B.1.2. Model Assumptions

The water quality modeling methodology requires that some assumptions are made for both the model input parameters and the way the modeling calculations are carried out. Section B.2.6 discusses the assumptions that were made in the development of the model parameters and Section B.3.4 discussion the assumptions of the modeling methodology. Section B.4 discusses the affects on model accuracy of the modeling assumptions.

B.2. Model Input Parameters

Many parameters that can affect pollutant loads and concentrations vary between locations where stormwater monitoring has been conducted. Examples include source concentrations, topography, soil type, and rainfall characteristics all of which can influence the buildup and mobilization of pollutants. The following model parameters represent the best data currently available for representation of existing and developed site conditions in the water quality model.

B.2.1. Storm Events

Rainfall analysis was conducted with data from the National Climatic Data Center (NCDC) Newhall rain gauge (station number 046162), located in the town of Newhall California. Figure B-1 shows the location of the Newhall gauge in relation to the Newhall Ranch Project area. This gauge is located approximately 7 miles from the project. The gauge elevation of 1,243 ft AMSL is comparable to the Landmark Village Project area elevations of around 1,000-1,200 ft AMSL.

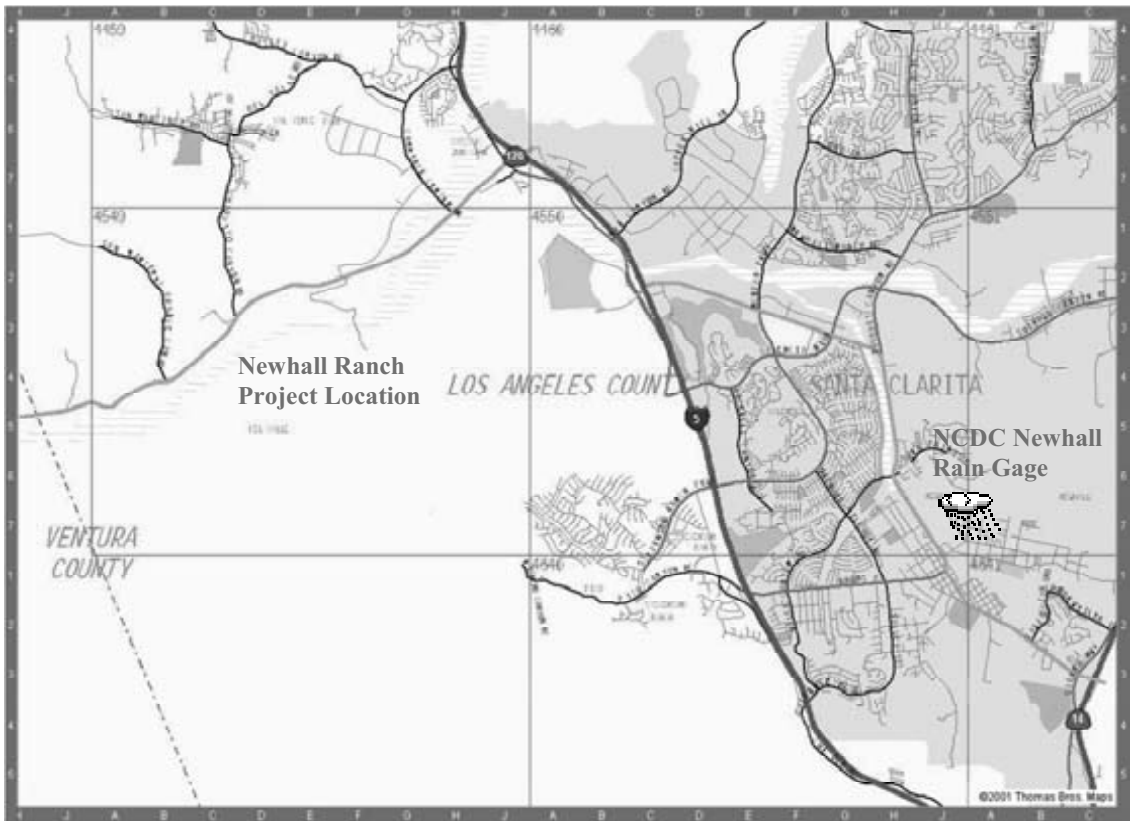

Figure B-1: Location of Newhall Rain Gauges in the Vicinity of the Project Area

While the period of record rainfall data collected at the Newhall rain gauge is quite good, there are still some gaps in the 35 year period of record. In order to improve the characterization of rainfall at the project site, estimates of the missing rainfall data were made through correlation of the Newhall rain gauge with the San Fernando rain gauge (NCDC station number 047762) which is located approximately 5 miles away (south and slightly east).

First a comparison of daily rainfall totals was made from the available data to assess the similarity in rainfall amounts between the two stations. Daily data from 1969 to 2003 was screened to keep the 24-hour totals with measured rainfall at both stations, which eliminated missing data at either station. Correlation of the 24-hour rainfall totals is shown in Figure B-2.

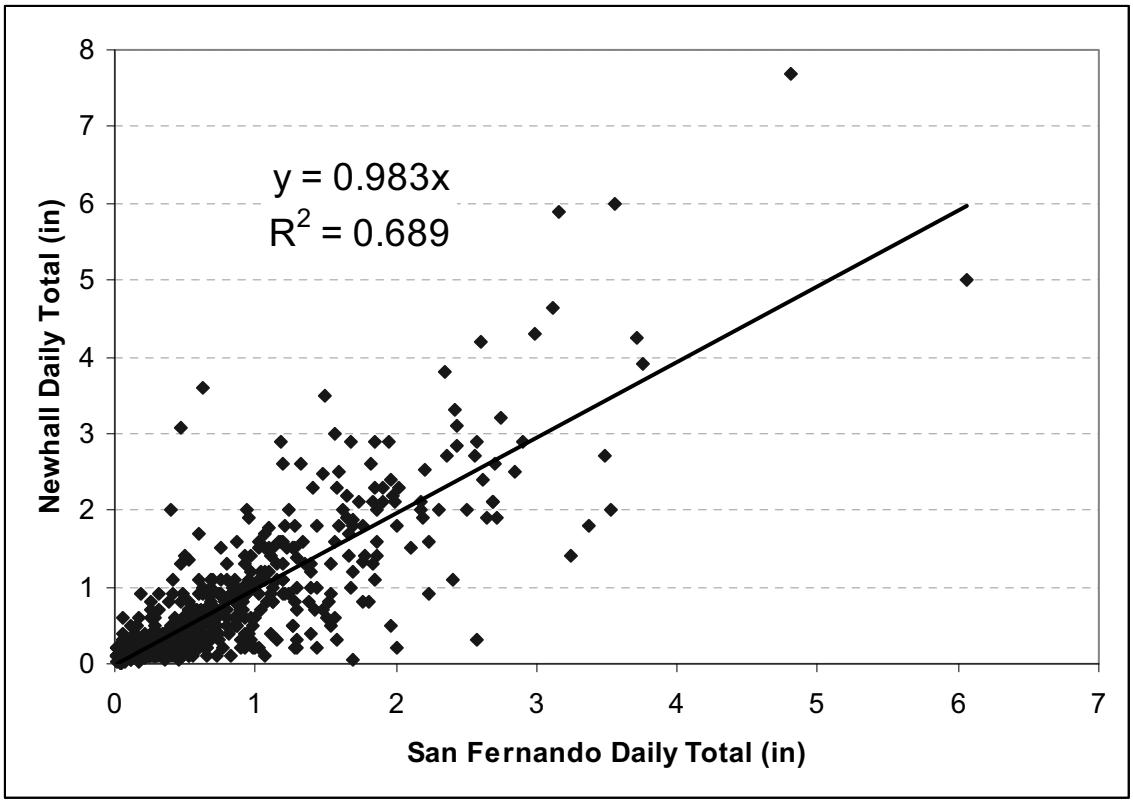

Figure B-2: Correlation of 24-hour Totals Newhall & San Fernando 3 Gauges

The correlation is reasonably strong considering that the comparison is between the daily accumulations, i.e. a storm could result in appreciable rainfall at one gauge and little rainfall at the other. This comparison indicates that precipitation depths are similar between the two gauges. Another comparison was made using only months with a complete rainfall record and measured rainfall at both stations. This correlation was much stronger due to the longer time period.

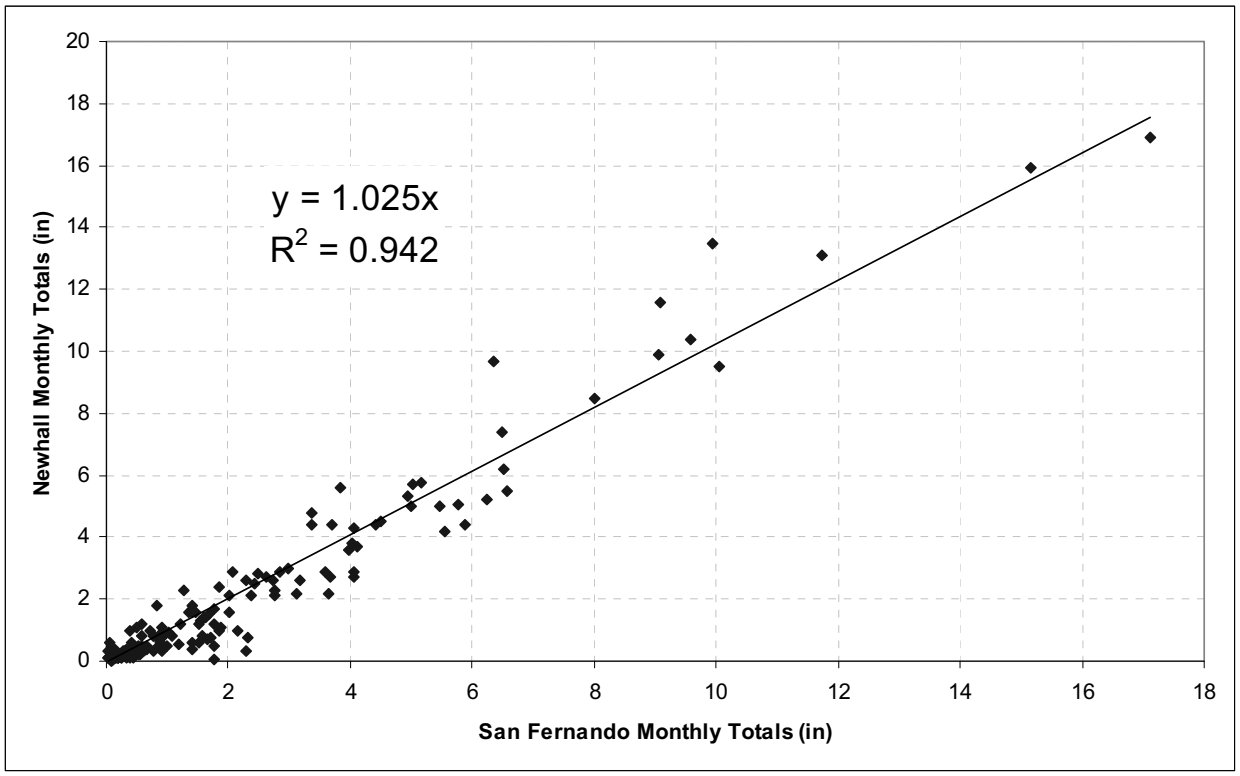

Figure B-3: Correlation of Monthly Totals Newhall & San Fernando 3 Gauges

The linear regression of daily rainfall totals (Figure B-2) has greater variability due to the shorter time period than regression of the monthly totals which indicates slightly higher rainfall amounts (Figure B-3) at the Newhall gauge compared to the San Fernando gauge. Hourly rainfall data from the San Fernando gauge were used to fill in the missing periods of rainfall data at the Newhall gauge using a multiplier of 1.025 and rounding to the nearest 1/100 inch after the adjustment.

Rainfall analysis was conducted for all storm events and for the storms that are expected to contribute to stormwater runoff (storms >0.1 inches). The rainfall data were analyzed using code similar in performance to EPA's Synoptic Rainfall Analysis Program (SYNOP). The customized code (GeoSYNOP) was used as it provide information on missing periods of data and is more robust when handling the date and time of storms. GeoSYNOP subdivides the rainfall record into discrete events separated by a dry inter-event period, which in this case was set to a minimum of 6 hours. Small rainfall events whose depth was less than or equal to 0.10 inches were deleted from the record as such events tend to produce little if any runoff (for the second analysis in Table B-1). For the Newhall gauge, a total of 538 storm events (>0.1 inches) were segregated from the continuous data.

Rainfall analysis was conducted with the original rainfall data and the augmented data in order to asses if the additional of data affected the storm statistics. Filling in the rainfall record should result in a small increase in the number of storms per year and the average annual rainfall, but should not substantially change the storm statistics.

Table B-1: Analysis Results for the Actual and Filled Newhall Rainfall Data

Storms	Newhall Gauge 1969 – 2003	Original Record	Augmented Record
	Total Missing Records (days):	427	52
All Storms	Average annual rainfall (in):	17.4	18.8
	Total number of storms:	840	890
	Average number of storms per year:	24.0	25.4
	Average storm volume (in):	0.72	0.74
	Average storm duration (hrs):	6.87	7.35
	Average storm intensity (in/hr):	0.103	0.101
Storms >0.1 inch	Average annual rainfall (in):	16.2	17.9
	Total number of storms:	493	538
	Average number of storms per year:	14.1	15.4
	Average storm volume (in):	1.15	1.16
	Average storm duration (hrs):	11.0	11.5
	Average storm intensity (in/hr):	0.107	0.105

Comparison of the results for the original and constructed records shows that the storm statistics do not change substantially, particularly for the second analysis using only storms greater than 0.1 inches depth which are used in the water quality model to predict stormwater runoff. Storms less than or equal to 0.1 inches depth were screened as these small storms typically do not contribute to runoff (USEPA, 1989; Schuler, 1987). The augmented record for the Newhall gauge was used for both hydrologic (e.g. estimating BMP percent capture) and water quality modeling.

B.2.2. Runoff Coefficients

B.2.2.1. SWMM Runoff Coefficient Modeling Parameters

The Monte-Carlo Water Quality model uses a linear equation to estimate a runoff coefficient for sub-basins as a function of the percent impervious. The runoff coefficient equation parameters (coefficient and intercept) were estimated with the SWMM model in an effort to more accurately reflect the Landmark Village Project site conditions. The majority of the SWMM modeling parameters are shown in Table B-2.

Table B-2: SWMM Runoff Module Parameters

SWMM Runoff Parameters	Units	Values
Wet time step	Seconds	600
Wet/dry time step	Seconds	600
Dry time step	Seconds	14,400
Impervious Manning's n		0.012
Pervious Manning's n		0.25
Drainage area modeled for Rv determination	acres	10
Shape		Rectangular, 500 ft flow path length for pervious areas, 250 ft flow path length for impervious area
Impervious Fractions Modeled		0%, 33.3%, and 100%. See Table B-3 for specific runoff block dimensions.
Slopes	Ft/ft	0.02, project area is relatively flat.
Evaporation	In / month	80% of reference ET values contained in Table B-5 were used for the existing site conditions to reflect agricultural uses and the post-development project condition.
Soil properties / infiltration		Green-Ampt soil parameters as contained in Table B-4.
Depression storage, impervious	Inches	0.02, based on Table 5-14 in SWMM manual
Depression storage, pervious	Inches	0.06, based on Table 5-14 in SWMM manual
Initial Soil moisture deficit		0.32 (porosity – moisture content)

Runoff path lengths will affect the ET that occurs and subsequent runoff volumes; the longer the runoff path length the greater the reduction in runoff volumes (evaporation losses impervious surfaces, ET and infiltration pervious surfaces). For consistency in model runs (e.g. flow path lengths) three scenarios were modeled as shown in the Table B-3. The modeled impervious fractions were chosen to result in consistent runoff path lengths and depths of runoff from pervious and impervious surfaces relative to the 659 inches of rainfall for the period of record that was simulated.

Table B-3: SWMM Runoff Block Modeled Percent Impervious Values

Area (ac)	% Impervious	SWMM Width (ft)	Pervious Flow Length (ft)	Pervious Flow Length (ft)
10	0	871	500	0
10	33.3	581	500	250
10	100	1742	0	250

Some soils in the vicinity of the project area have been classified as sandy-loam soils deposited by the Santa Clara River (R.T. Frankian & Associates, 2001). Soils in the Landmark Village Project area were conservatively modeled with infiltrative capacity comparable to silt-loam soils, resulting in little surface runoff for the existing condition and a conservative estimate for the developed condition when further reducing the hydraulic conductivity by 25 percent to account for compaction. The Green-Ampt soils properties used for the SWMM modeling are shown in Table B-4.

Table B-4: Green-Ampt Soil Parameters

Soil Texture Class	Suction Head (cm)	Ks (cm/hr)	Suction Head (in)	Ks (in/hr)
Silt Loam – Existing Condition	16.68	0.68	6.57	0.27
Silt Loam – Developed Condition	16.68	0.51	6.57	0.20

Soil properties estimated from information contained in Table 5.5.5 of the Handbook of Hydrology (Maidment, ed. 2003)

Reference ET values for estimating actual ET rates was taken from Figure B-4 produced by the California Department of Water Resources. The Landmark Village Project site is located in zone 14. Reference ET values for zone 14 are reproduced in Table B-5.

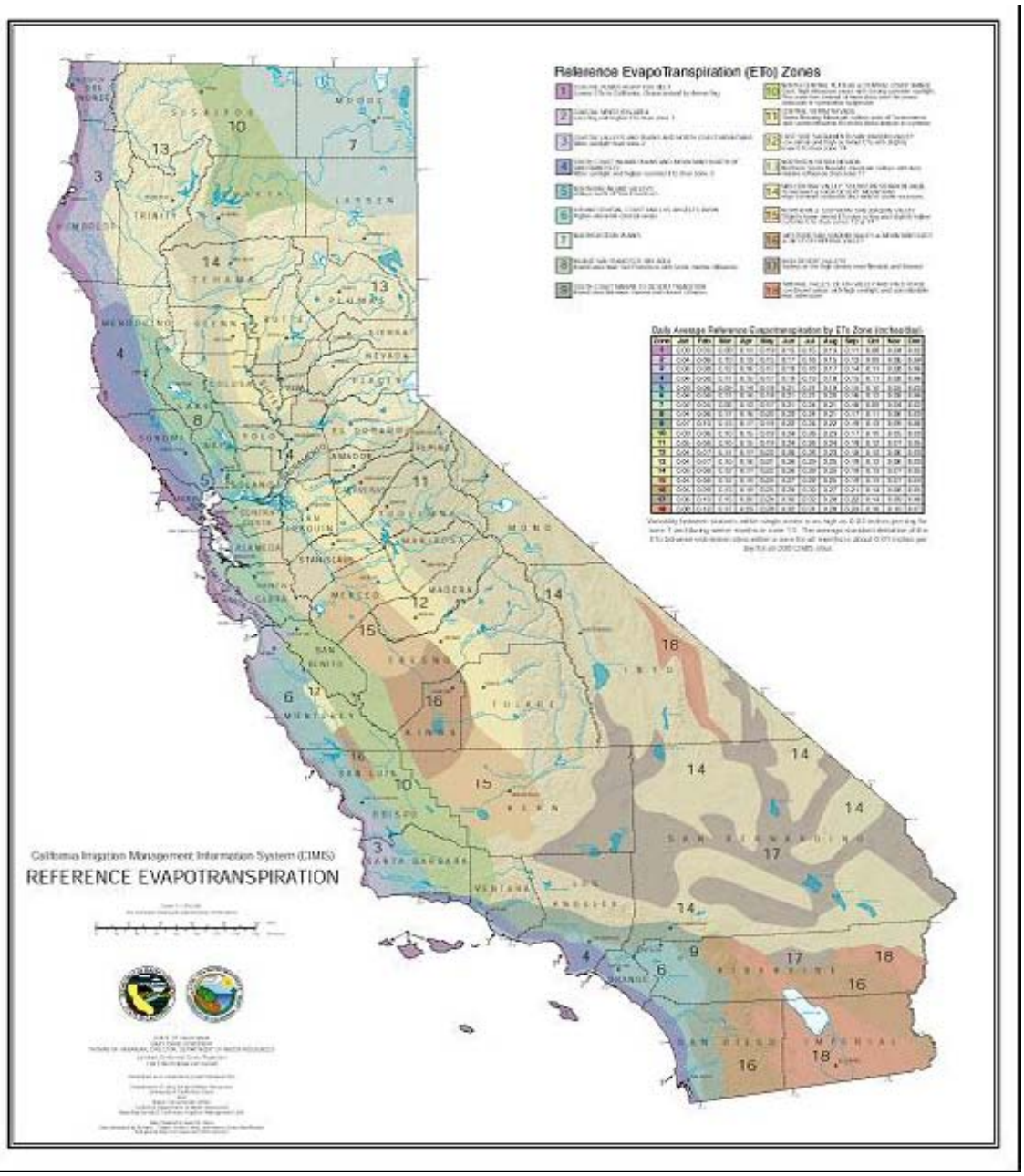

Figure B-4: Reference ET for CA Zones

Existing site conditions consist of agricultural row crops, both irrigated and dry farming. To represent average existing site conditions 80% of the reference ET values were used to reflect dry farming crops with lower water requirements and irrigated farming with slightly higher evapotranspiration rates. Eighty percent of the reference ET values were also used to simulate the landscaped areas in the post-development condition.

Table B-5: Evaporation Parameters for Hydrology Model (from CA ETo map)

Month	Evapotranspiration Rates			80%
	In / day	Days / month	In / Month	In / Month
January	0.05	31	1.55	1.24
February	0.08	28	2.24	1.79
March	0.12	31	3.72	2.98
April	0.17	30	5.1	4.08
May	0.22	31	6.82	5.46
June	0.26	30	7.8	6.24
July	0.28	31	8.68	6.94
August	0.25	31	7.75	6.2
September	0.19	30	5.7	4.56
October	0.13	31	4.03	3.22
November	0.07	30	2.1	1.68
December	0.05	31	1.55	1.24
	Total	365	57.04	45.63

B.2.2.2. SWMM Runoff Coefficient Results

Figure B-5 displays the SWMM results for the existing conditions of the Project site and Figure B-6 displays the SWMM results for the developed project conditions.

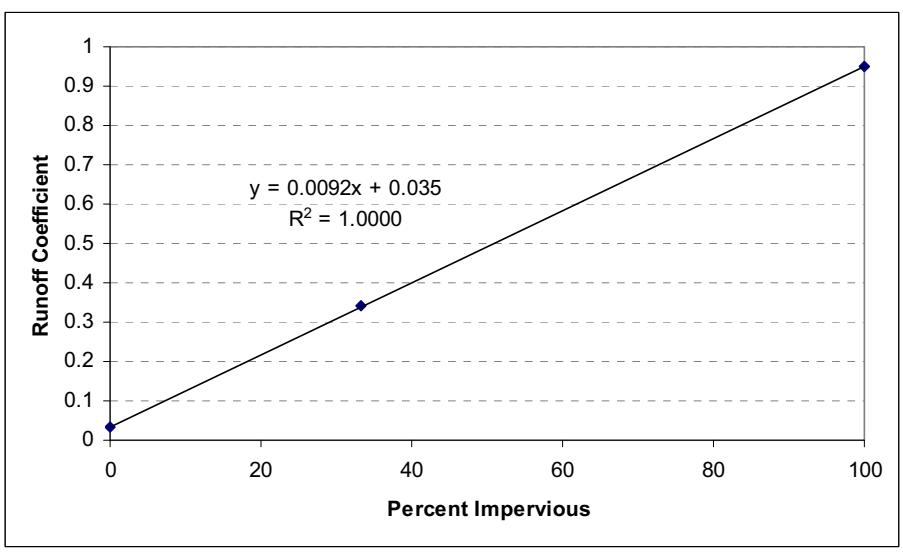

Figure B-5: Existing Conditions Runoff Coefficient Equation

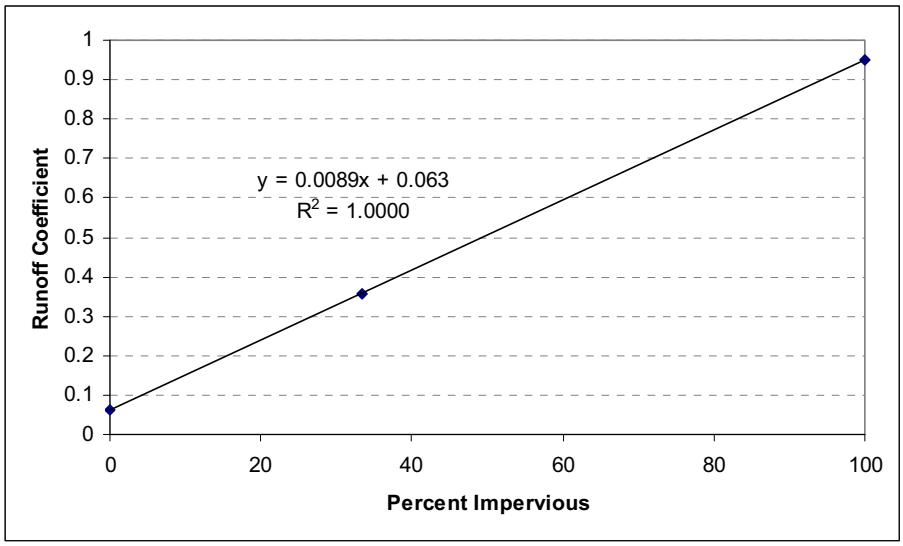

Figure B-6: Developed Conditions Runoff Coefficient Equation

The intercept was rounded to three decimal places resulting in the following equations used to estimate runoff coefficients in the water quality model as a function of imperviousness

- Existing Conditions: Runoff Coefficient = 0.0092 × % Impervious + 0.035
- Developed Conditions: Runoff Coefficient = 0.0089 × % Impervious + 0.063

B.2.3. Land Use

Detailed land use data has been developed for the Landmark Village sub-division within Newhall Ranch. The delineation and area of the modeled sub-basins within Landmark Village were determined from information provided by PSOMAS engineering. Sub-basin areas, proposed land-uses, and land use impervious values are summarized in Table B-7 below.

Table B-8 provides the sub-basin total areas, percent impervious, and treatment BMPs. The existing conditions of the Landmark Village Project area consist of agricultural uses. All existing project areas (287.5 acres) were modeled as agriculture in the water quality model.

Included in the water quality analysis are 19.8 acres of off-site project areas. The section of State Route 126 (SR126) adjacent to the Landmark Village Project area will undergo widening to increase capacity of the freeway. Modeled areas for SR126 are shown in Table B-6.

Table B-6: Off-site State Route 126 Land Use and Treatment

Development Condition	Impervious Freeway Surface (acres)	Pervious Area (acres)	Total Area (acres)	Treatment BMPs
Existing	12.0	19.6	31.6	none
Developed	19.8	11.8	31.6	CALTRANS Swales

Table B-7: Modeled Developed Sub-basin Land Uses & Areas

Sub-basin	Land Use Type, % Impervious[1] & Area (acres)						
	Single family	Multi family	Commercial	Park	Open Space	Roadway	School
	42%	68%	92%	15%	0%	100%	82%
RVE-8A		11.69	5.2		5.71	1.88	4.32
RVE-9A		4.11	1.79		0.07	1.98	4.64
RVE-10A					1.1		
RVE-11B	2.78	7.53			2.35	3.54	
RVE-12C					1.2		
RVE-13C	4.24	6.64		0.82		4.8	
RVE-16D					2.1		
RVE-17D	13.17					4.83	
RVE-20E		9.01	2.16	3.45		3.68	
RVE-21F					0.7		
RVE-24F					1.5		
RVE-25F	10.2					4.2	
RVC-2A				9.52	1.38		
RVC-3A		6		0.37	2.57	2.96	
RVC-7A	4.6					5.6	
RVC-8A		3.82				1.28	
RVC-11B	8.05	2.13			0.16	6.06	
RVC-12C				3.4			
RVC-13C					1.1	0.4	
RVC-17C					2.1		
RVC-18C	6.01	7.53			0.26	3.6	
RVC-21D					2.6		
RVC-22D						2.5	
RVC-23E		12.83	16.16	0.96	6.63	2.68	
RVC-24E		2.1				5.3	
RVW-1A		3.97	4.7		2.13		
RVW-2A		1.22	4.24	1.47	2	5.77	
TOTAL	49.05	78.58	34.25	19.99	35.66	61.06	8.96

[1] Value listed in the LA County Hydrology Manual.

Sub-basin total area, percent imperviousness and treatment BMPs for the Landmark Village sub-division are listed in

Table B-8.

Table B-8: Modeled Developed Area, Percent Imperviousness, & BMPs

Drainage Area	Area (acres)	Treatment BMP(s) and Location
RVE-8A	28.80	Swales within sub-basin RVE-8A
RVE-9A	12.59	RVC-12C
RVE-10A	1.10	Swale BMP area
RVE-11B	16.20	RVE-12C
RVE-12C	1.20	Swale BMP area
RVE-13C	16.50	RVE-16D
RVE-16D	2.10	Swale BMP area
RVE-17D	18.00	RVE-21F
RVE-20E	18.30	RVE24F-Bioretention in islands
RVE-21F	0.70	Swale BMP area
RVE-24F	1.50	Swale BMP area
RVE-25F	14.40	RVE-10A
RVC-2A	10.90	RVC-12C & RVC-13C
RVC-3A	11.90	RVC-12C & RVC-13C
RVC-7A	10.20	RVC-12C & RVC-13C
RVC-8A	5.10	RVC-12C & RVC-13C
RVC-11B	16.40	RVC-17C
RVC-12C	3.40	Swale BMP area
RVC-13C	1.50	Swale BMP area
RVC-17C	2.10	Swale BMP area
RVC-18C	17.40	RVC-21D (swale)
RVC-21D	2.60	Water quality basin and Bioretention BMP area
RVC-22D	2.50	RVC-21D (WQ basin)
RVC-23E	39.26	Swales within sub-basin RVE-23E
RVC-24E	7.40	RVC-21D (WQ basin)
RVW-1A	10.80	Swale within sub-basin RVW-2A
RVW-2A	14.70	Swale within sub-basin RVW-2A
Project Total	287.55	

B.2.4. Stormwater Runoff Pollutant Concentrations

Stormwater monitoring data collected by the Los Angeles Department of Public Works was used to derive estimates of pollutant concentrations for urban land uses. The existing conditions of the Landmark Village Project site contain agricultural uses. Stormwater monitoring data collected by Ventura County was used to estimate stormwater pollutant concentrations for agricultural land use.

B.2.4.1. Los Angeles County Monitoring Data

More recent and more regional land-use based stormwater quality monitoring data was collected through the LA County Stormwater Monitoring Program. This program was initiated with the goal of providing technical data and information to support effective watershed stormwater quality management programs in Los Angeles County. Specific objectives of this project included monitoring and assessing pollutant concentrations from specific land uses and watershed areas. In order to achieve this objective, the County undertook an extensive stormwater sampling project that included 8 land use stations and 5 mass emission stations, which were tested for 82 water quality parameters. These data are presented in *Los Angeles County 1994-2000 Integrated Receiving Water Impacts Report, 2000* and *Los Angeles County 2000-2001 Stormwater Monitoring Report, 2001*.

Stormwater quality was estimated with the recent EMC data collected by LA County (LA County, 2000) in the water quality models for Newhall Ranch and the Landmark Village sub-division. These data were used because of the relatively close location to the project site and because the monitored land uses were representative of the proposed land uses for the Newhall Ranch Project. The land uses stations available through monitoring conducted by LA County used to develop stormwater quality parameters for the modeling are listed in Table B-9 with a brief description of the site and the years monitoring data have been collected.

Table B-9: LA County Land Use Monitoring Stations Available for Water Quality Modeling

Station Name	Sta-tion	Modeled Land Use	Site Description[1]	Years Monitoring Conducted
Santa Monica Pier	S08	Commercial	The monitoring site is located near intersection of Appian Way and Moss Avenue in Santa Monica. The storm drain discharges below the Santa Monica Pier. Drainage area is approximately 81 acres. The Santa Monica Mall and Third St. Promenade dominate the watershed with remaining land uses consisting of office buildings, small shops, restaurants, hotels and high-density apartments.	1995-1999
Sawpit Creek	S11	Open Space (& Parks)	Located in Los Angeles River watershed in City of Monrovia. The monitoring station is Sawpit Creek, downstream of Monrovia Creek. Sawpit Creek is a natural watercourse at this location. Drainage area is approximately 3300 acres.	1995-2001

Station Name	Sta-tion	Modeled Land Use	Site Description[1]	Years Monitoring Conducted
Project 620	S18	Single Family Residential	Located in the Los Angeles River watershed in the City of Glendale. The monitoring station is at the intersection of Glenwood Road and Cleveland Avenue. Land use is predominantly high-density, single-family residential. Drainage area is approximately 120 acres.	1995-2001
Dominguez Channel	S23	Freeway (Roadways)	Located within the Dominguez Channel/Los Angeles Harbor watershed in Lennox, near LAX. The monitoring station is near the intersection of 116th Street and Isis Avenue. Land use is predominantly transportation and includes areas of LAX and Interstate 105.	1995-2001
Project 474	S25	Education (Schools)	Located in Los Angeles River watershed in the Northridge section of the City of Los Angeles. The monitoring station is located along Lindley Avenue, one block south of Nordoff Street. The station monitors runoff from the California State University of Northridge. Drainage area is approximately 262 acres.	1997-2001
Project 404	S26	Multi-Family Residential	Located in Los Angeles River watershed in City of Arcadia. The monitoring station is located along Duarte Road, between Holly Ave and La Cadena Ave. Drainage area is approximately 214 acres.	1997-2001

1) Los Angeles County 1999-2000 Draft Stormwater Monitoring Report (Los Angeles County, 2000)

B.2.4.2. Ventura County Monitoring Data

As part of its NPDES permit, the Ventura County Flood Control District conducts storm water monitoring to determine water quality of stormwater runoff from areas with specific land uses. Land use monitoring is designed to capture stormwater discharge from a specific type of land use. The usefulness of the urban runoff data collected by Ventura County was limited as the monitoring only included industrial and residential land uses and did not specify between types of residential development (i.e. single or multi family and housing density). One monitoring station, Wood Road at Revolon Slough (site A-1), drains the approximately 350 acre Oxnard Agricultural Plain, which is comprised almost entirely of agricultural land (primarily row crops), including a small number of farm residences and ancillary farm facilities for equipment maintenance and storage. Data from the Wood Road station was used to estimate pollutant concentrations in stormwater runoff for agricultural land use.

Land use runoff sampling for the Ventura County stormwater monitoring program originally began during the 1992/93 monitoring season, with up to several samples collected at each site during each storm season to support the monitoring and reporting program required by their MS4 permit. For the A-1 site, the period of record begins during the 1996/97 storm season, and continues through the 2003/04 season. All land use monitoring sites are equipped with

automated monitoring equipment, including flowmeters (with area-velocity probes and level sensors) and refrigerated auto-samplers which enable the collection of flow-weighted composite samples. Stormwater quality monitoring data for the agricultural land use site was provided by Mark Davis of the Ventura County Watershed Protection District. This information was extracted from their newly-constructed water quality database, which contains monitoring data for their land use, mass emission, and receiving water monitoring sites.

B.2.4.3. Data Analysis for Derivation of Land Use EMCs

The County of Los Angeles Department of Public Works (LADPW) has monitored stormwater runoff quality from various land uses throughout the County on an annual basis beginning in 1995 through 2001. For each year of monitoring several storm event mean concentrations (EMCs) are reported and included in the County's annual water quality report to the Los Angeles Regional Water Quality Control Board. The convention for dealing with the censored data (e.g., data only known to be below the analytical detection limit) is to substitute ½ of the detection limit for all non-detects. L.A. County has followed this convention when providing summary arithmetic statistics of the stormwater monitoring data. This method tends to introduce bias into the estimate of the mean and standard deviation and the summary statistics are not believed to be robust or adequately account for non-detects. To further complicate matters, the detection limit for dissolved copper and total lead has changed during the period stormwater monitoring was conducted by LADPW.

In an effort to provide more reliable and accurate estimates of land use EMCs for the Landmark Village water quality modeling, a robust method of estimating descriptive statistics for censored data with multiple detection limits was employed. The plotting position method described in Helsel and Cohn (1988) was used to estimate censored values using the distribution of uncensored values. Descriptive statistics were then estimated using the parametric bootstrap method suggested by Singh, Singh, and Engelhardt (1997).

Example Data Set

To illustrate the statistical methods used to obtain land use EMCs, the LADPW stormwater monitoring data collected for total lead from the transportation land use station is used. The data were collected from 01/1996 to 04/2001. At the beginning of March 1997 the detection limit for total lead changed from 10 to 5 µg/L. Table B-10 describes the data according to the number of censored and uncensored values in the example data set.

Table B-10. Number of Censored and Uncensored Data Points in the Total Lead Transportation Land Use Data Set

Total Lead EMC Data for Transportation Land Use	
Uncensored	37
Censored < 10 µg/L	2
Censored < 5 µg/L	38
Total Data Count	77

Prior to applying the plotting position method, it is necessary to check the normality of the data. Figure B-7shows histograms and probability plots of the transportation land use total lead data above detection limits in normal and lognormal space. The lognormal distribution fits the data set more closely than the normal distribution.

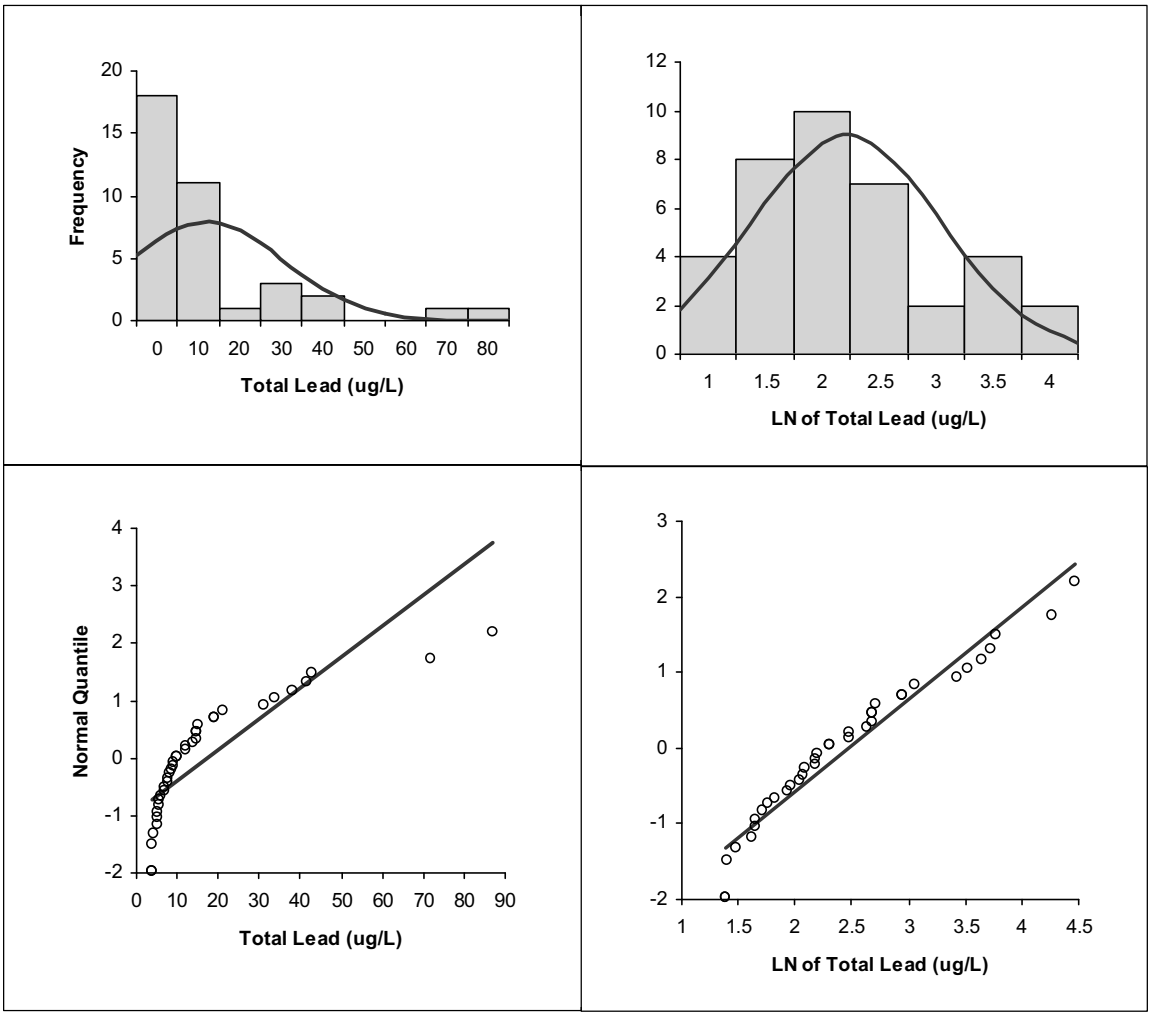

Figure B-7: Histograms and Probability Plots of Transportation Total Lead Data in Arithmetic and Lognormal Space.

To verify the visual check that the data are lognormally distributed, the Shapiro-Wilk goodness-of-fit test was used (Royston 1992). In this test, if $p > 0.1$, the null hypothesis that the log data follow a normal distribution cannot be rejected. For this example data set, the p-value of the log-transformed uncensored data is 0.293, which indicates that lognormal distribution is a good approximation of the distribution of the data set.

Method for Dealing with Multiple Detection Limits

To account for the multiple detection limits in the censored data sets, a regression on order statistics (ROS) method was employed. ROS is a category of robust methods for estimating descriptive statistics of censored data sets that utilize the normal scores for the order statistics (Shumway et al. 2002). The plotting position method by Hirsch and Stendinger (1987) (summarized by Helsel and Cohn, 1988) was the ROS method used. In this method, plotting positions are based on conditional probabilities and ranks, where the ranks of the censored (below detection) and uncensored data (above detection) related to each detection limit are ranked independently. The method is summarized in the equations below.

After plotting positions for the censored and uncensored values have been calculated, the uncensored values are plotted against the z-statistic corresponding to the plotting position and the best-fit line of the known data points is derived. Using this line and the plotting positions for the uncensored data, the values for the uncensored data are extrapolated. Figure B-8 illustrates the results the application of the plotting position method on the total lead data for transportation land use.

$$pe_j = pe_{j+1} + \frac{A_j}{(A_j + B_j)} \times (1 - pe_{j+1}) \qquad (1)$$

Where:

A_j = the number of uncensored observations above the j detection limit and below the j +1 detection limit.

B_j = the number of censored and uncensored observations less than or equal to the j detection limit.

pe_j = the probability of exceeding the j threshold for j = m, m -1, … 2, 1 where m is the number of thresholds; by convention $pe_{m+1} = 0$.

Equation 2 was used for plotting the uncensored data and equation 3 was used for the plotting censored data; the plotting positions of the data were calculated using the Weibull plotting position formula.

$$p(i) = (1 - pe_j) + \frac{(pe_j - pe_{j+1}) \times r}{(A_j + 1)} \qquad (2)$$

Where:

p(i) = the plotting position of the uncensored i data point.

r = the rank of the i observation of the A_j observations above the j detection limit.

$$pc(i) = \frac{(1 - pe_j) \times r}{(n_j + 1)} \qquad (3)$$

Where:

pc(i) = the plotting position of the censored i data point.

r = the rank of the i observation of the n_j censored values below the j detection limit.

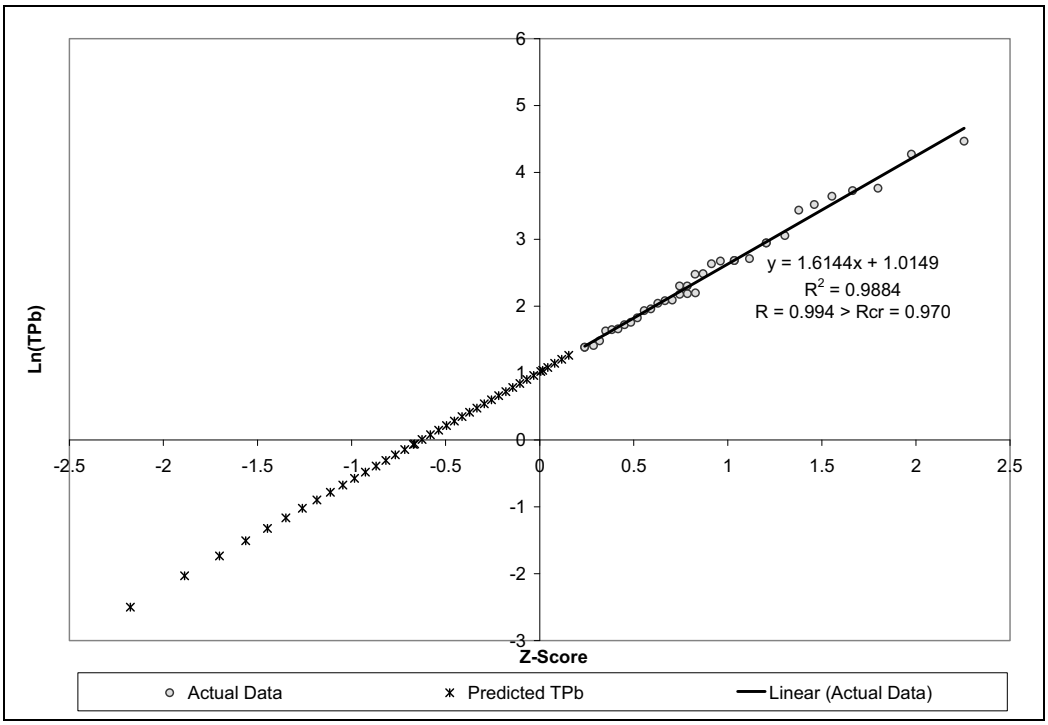

Figure B-8: Probability Plot of the Uncensored and Predicted (Censored) Total Lead Transportation EMCs.

Method for Calculating Descriptive Statistics

After the censored data are estimated (or for datasets without non-detects), descriptive statistics were computed using the bootstrap method (Singh et al. 1997). The bootstrap method samples from the data set with replacement several thousand times and calculates the desired descriptive statistics from the sampled data. The steps of the bootstrap estimation method are described below.

1. Take a sample of size *n* with replacement (the sampled data point remains in the data set for subsequent sampling) from the existing data set (Singh et al. recommends n be the same size as the original data set, this recommendation was followed for the analysis) and compute the descriptive statistic, θ_i, from the sampled data.
2. Repeat Step 1 independently N times (10,000 for this analysis) each time calculating a new estimate for θ_i.
3. Calculate the bootstrap estimate θ_B by averaging the θ_i's for i=1 to N

Fundamentally, the bootstrap procedure is based on the Central Limit Theorem (CLT), which suggests that even when the underlying population distribution is non-normal, averaging produces a distribution more closely approximated with normal distribution than the sampled

distribution (Devore 1995). Figure B-9 compares the total lead data after estimating censored values using the ROS method described prior to applying the bootstrap method with bootstrapped means of the ROS data. Note the bootstrap means are more normally distributed than the original data and the central tendency of the data is centered near 8 ug/L.

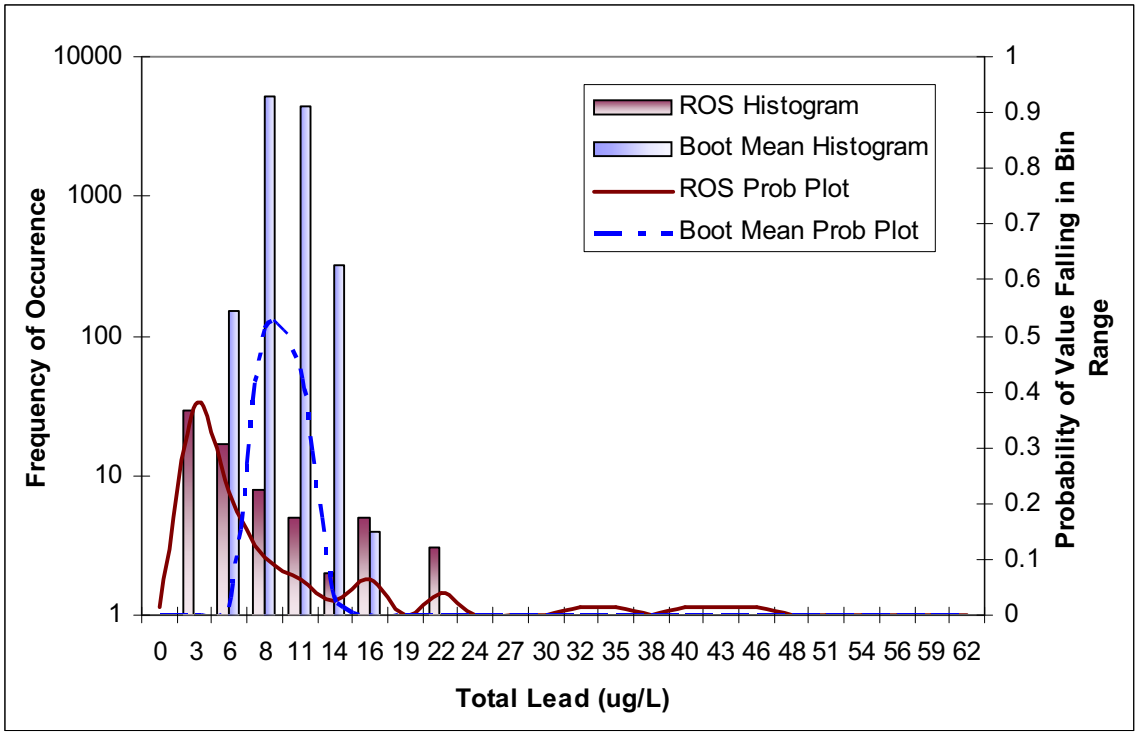

Figure B-9: Comparison of the Distribution of ROS Method Total Lead Data and the Bootstrap Means of the ROS Data.

The majority of the LADPW stormwater monitoring for the pollutant land use combinations analyzed fit a lognormal distribution. The data that did not statistically fit the lognormal distribution were more closely approximated with a lognormal distribution than a normal distribution. The bootstrap method was applied differently depending on the distributional fit of the data. If the pollutant EMC data for a particular land use fit a lognormal distribution according to the Shapiro-Wilk goodness-of-fit test the log-transformed data were bootstrapped and an estimate of the mean and standard deviation were obtained in log space and then converted to arithmetic space. The assumption of lognormality was more stringently applied than normal by using an alpha significance value of 0.1. This was done to improve the estimate of the standard deviation when the hypothesis of lognormality is rejected. When analyzing data in log space there is a tendency to overestimate the standard deviation for relatively symmetric data and underestimate the standard deviation for severely skewed data. For datasets that did not fit the lognormal distribution, the raw data were bootstrapped to obtain the mean and standard deviation statistics. Bootstrapping the data in arithmetic space assumes no distribution in those instances when a distribution could not be confirmed through goodness-of-fit testing.

Conclusions

The plotting position method for multiple detection limits has been used in conjunction with the bootstrap procedure for calculating the descriptive statistics used to represent pollutant EMC distributions in the water quality model. If the uncensored data were determined to be lognormally distributed with less than 50% of the data below the detection limit (censored), the bootstrap procedure was coupled with lognormal theory (i.e. data were log transformed prior to the bootstrap analysis). Otherwise, the original data plus the estimates of the censored data were analyzed in arithmetic space to calculate the arithmetic mean and standard deviation. Table B-11 summarizes the lognormal descriptive statistics of the modeled pollutants and land uses that are used directly by the Monte Carlo water quality model for estimating land use specific pollutant EMCs.

Table B-11: Lognormal Statistics for Modeling Pollutants Concentrations from Land Uses.

Land Use		TSS	TP	NH3	NO3	NO2	TKN	Diss Cu	Tot Pb	Diss Zn	Cl
Commercial	Mean	3.966	-1.242	-0.832	-0.884	-2.721	0.711	2.210	1.292	4.778	3.043
	St. Dev	0.609	0.680	1.218	0.635	1.060	0.804	0.685	1.389	0.703	1.226
Education	Mean	4.097	-1.375	-1.838	-0.750	-3.127	0.296	2.163	0.777	4.121	2.380
	St. Dev	0.923	0.515	1.111	0.626	1.177	0.604	0.733	0.891	0.531	1.264
Transportation	Mean	3.935	-1.229	-1.271	-0.687	-3.011	0.345	2.806	1.902	4.783	1.261
	St. Dev	0.834	0.992	0.608	0.749	1.056	0.654	1.116	0.631	1.040	0.998
Multi-Family Residential	Mean	3.144	-1.788	-1.208	-0.180	-2.932	0.346	1.768	0.812	3.965	2.124
	St. Dev	0.920	0.728	0.886	0.930	1.102	0.556	0.576	0.985	0.707	1.119
Single Family Residential	Mean	4.178	-1.170	-1.248	-1.219	-3.198	0.734	1.869	1.762	2.392	1.440
	St. Dev	1.026	0.640	0.964	1.274	1.191	0.747	0.783	0.997	1.085	0.570
Agriculture (Ventura County)	Mean	6.754	0.990	0.338	2.519	-2.120	1.948	2.839	3.015	3.252	3.666
	St. Dev	0.551	0.469	0.712	0.460	0.000	0.380	0.536	0.763	0.847	0.689
Vacant / Open Space	Mean	3.342	-3.060	-3.075	-0.033	-3.976	-0.458	-2.573	-1.246	1.293 [1]	1.864
	St. Dev	1.859	1.064	0.811	0.548	0.459	0.784	1.505	1.616	1.312	0.226

1 – Dissolved zinc for open space was estimated from the total zinc analysis of LADPW monitoring data. Four data points for dissolved and total zinc from the National Stormwater Quality Database gave an average ration of dissolved to total zinc of 50 percent. For the open space land uses the variation of dissolved zinc was assumed to equal that of total zinc (i.e. same standard deviation) and the lognormal mean was set to give an average concentration of 8.6 ug/L for the open space land use, half of the average total zinc concentration of 17.2 ug/L.

Table B-12: Resulting Arithmetic Means from Lognormal Statistics for Modeling Pollutant Concentrations

Land Use	TSS	TP	NH3	NO3	NO2	TKN	Diss Cu	Tot Pb	Diss Zn	Cl
Commercial	63.5	0.364	0.913	0.505	0.115	2.81	11.5	9.55	152	44.5
Education	92.1	0.289	0.295	0.575	0.088	1.61	11.4	3.23	70.9	24.0
Transportation	72.4	0.478	0.338	0.666	0.086	1.75	30.8	8.17	205	5.80
Multi-Family Residential	35.4	0.218	0.442	1.29	0.098	1.65	6.92	3.66	67.7	15.6
Single Family Residential	110	0.381	0.457	0.665	0.083	2.75	8.81	9.57	19.7	4.97
Agriculture (Ventura County)	998	3.00	1.81	13.8	0.120	7.54	19.7	27.3	37.0	49.6
Vacant / Open Space	159	0.083	0.064	1.12	0.021	0.860	0.237	1.06	8.61	6.62

B.2.5. Estimate of BMP Performance Parameters

BMP performance is a function of the fraction of stormwater runoff receiving treatment (percent capture) and the effectiveness of removing pollutants from the treated stormwater. Capture efficiency calculations are discussed in Section B.2.5.1, and pollutant removal estimates are described in Section B.2.5.2.

B.2.5.1. BMP Capture Efficiency

The modeled structural BMPs were analyzed as flow or volume based. Different methods were used to calculate the capture efficiency of each type of BMP as discussed below.

B.2.5.1.1. Volume Based BMP Capture Efficiency

The GeoSYNOP program has the ability to provide descriptive statistics of storm events, based upon analysis of hourly rainfall records. Included in these statistics is the dry time between storms. This information, along with the storm depths and drainage rates of the volume based BMP (water quality basins), was used to estimate the capture efficiency (the fraction of stormwater receiving treatment) of the water quality basins (which are extended detention basins) for each storm in the period of record for use as inputs in the water quality model. The percent capture calculations for the water quality basins were made with the following steps.

Step 1 – Estimate Runoff Volumes for Each Storm in the Period of Record Modeled

The runoff volume for each storm in the period of record (538 storms) was calculated for the tributary area draining to each water quality basin. The augmented Newhall gauge data was used in order to provide a conservative estimate which accounts for all (probable) storms and results in slightly lower capture efficiency than the Newhall data alone. This is due to the addition of some fairly large storms through correlation with the San Fernando gauge and a few more storms with short inter-event times.

Step 2 – Determine Water Quality Basin Storage Capacity

Next, the available storage capacity of the water quality basins was calculated for each storm. If the time from the preceding storm was equal to or larger than 48 hours, the draw down time for the water quality basin, then the BMP was considered empty at the time of the storm.

If the time between storms was less than 48 hours, then the capture volume was calculated to account for the size of the previous storm and the dry period between storms. This is done to account for insufficient time for the water quality basins to completely empty before the next storm arrived. If the volume of stormwater runoff to the water quality basin from the previous storm was larger than the storage capacity of the water quality basin, then the basin was assumed to have filled completely and the initial storage capacity (*ISC*) in equation 4 is zero.

If the runoff volume (for a storm occurring less than 48 hours prior to the storm of interest) was less than the storage capacity of the BMP, then the difference between the storage capacity of the BMP and the runoff volume from the previous storm was considered available to capture runoff from the next storm. This volume is then added to the storage capacity created from outflow from the basin during the time of the storms as shown in equation 4.

$$TC = ISC + [BV \times DD \times T] \quad (4)$$

Where:

- TC = the treatment capacity (ft^3) of a water quality basin available to capture runoff over the duration of a storm
- ISC = the remaining storage volume after previous event (ft^3), initial storage capacity for storm of interest
- BV = the water quality basin volume (ft^3)
- DD = the draw down rate of water quality basin in percent per hour (hr^{-1}), 2.08% per hour for a 48 hour draw down time.
- T = the storm duration (hr)

The above equation accounts for storage capacity that is created during emptying of the water quality basin while a storm occurs. That is, during long duration storms more runoff can be processed through the water quality basin than for a short storm of comparable rainfall intensities and runoff rates. This method has produced percent capture results that consistently are in close agreement with the overall results from EPA's Stormwater Management Model (SWMM), which are used to verify the results from this method.

Step 3 – Determine Water Quality Basin Percent Captures for Storms

The storage capacity estimated from step 2 is compared to the runoff volume estimate from step 1. If the storage capacity exceeds the storm runoff volume then the storm is considered to be completely (100%) captured. If the storage capacity is less than the runoff volume a volume of runoff equal to the storage capacity is considered treated by the water quality basin. The percent capture for each storm estimated for each water quality basin is used in the Monte-Carlo model to calculate pollutant removals in the modeled BMPs.

Step 4 – Verify Percent Capture Estimates with SWMM

The above method is used as it provides an efficient method for estimating percent capture for each storm in the period of record, which is an input to the water quality model. SWMM is used to verify the results as it is considered to be more accurate than the above method due to the continuous simulation capability and the use of more detailed input parameters.

A SWMM run is conducted to simulate the drainage area (as described in Section B.2.2) tributary to the modeled BMP. The storage treatment block in SWMM is used to simulate the dry-extended detention basin through input of stage-discharge curve information. The SWMM results are then compared to the average annual results derived from the method above to verify that they are reasonably accurate, e.g. within a percentage point or two. Table B-17 demonstrates that the two methods provide comparable results. If the results from the above

method do not agree closely with SWMM then the results can be calibrated. For example the storage volume can be adjusted to derive results that closely match the SWMM results on an average annual basis.

B.2.5.1.2. Flow Based BMP Capture Efficiency

The flow based BMPs (swales) are sized to treat a flow capacity exceeding the LA County SUSMP sizing requirements in order to achieve treatment of approximately 80% of the stormwater runoff. Off-line swales (swales with a diversion structure for flows up to the swale treatment capacity) other BMPs such as CDS units that provide treatment even when a fraction of the runoff is bypassed achieve higher capture efficiency than in-line swales (swales that also act as a stormwater conveyance and receive all runoff from their tributary area).

High-intensity rainfall events can produce runoff rates that are in excess of the BMP design capacity. When the design flow rate for the swales is exceeded it was assumed that runoff depths exceed the design flow depth of the swale which limits treatment effectiveness. For this situation, reductions in pollutant loads were not modeled, although some limited removal likely occurs, in order to provide a conservative estimate of the BMP performance. Only when the flow rate in the swales was less than the design flow rates (and therefore flow depth) was treatment modeled by estimating the fraction of flows that meet this condition. The percent capture calculations for flow based BMPs used the following steps.

Step 1 – Estimate the Depth of Runoff Captured on an Hourly Basis

The percent capture estimate for each storm is made through comparison of the hourly rainfall data comprising the storm event to the design rainfall intensity of the flow-based BMP. For BMPs without bypass capacity (e.g. in-line swales) if the depth of rainfall for a given hour exceeds the design rainfall intensity (the flow rate resulting from the rainfall intensity in inches per hour) then no treatment is credited for that hour of rainfall. If the design capacity (in inches per hour) of the BMP meets or exceeds the depth of rainfall occurring in a given hour then the resulting runoff during that hour is considered capture by the BMP.

For off-line BMPs or other BMPs with bypass capability (e.g. hydrodynamic devices) the fraction of runoff captured during a given hour of rainfall is the minimum of the rainfall depth for the hour of the design capacity of the BMP. For example an off-line swale with a flow capacity equal to runoff generated from a rainfall intensity of 0.3 inches per hour would capture 100 percent of the runoff during a hour of precipitation data with a depth of 0.2 inches, but would only capture 50 percent of the runoff during an hour of precipitation data in which 0.6 inches of rain occurred.

Step 2 – Sum the Depth of Rainfall Capture for Each Storm Event

The depth of rainfall captured for each of during the storm event is then summed to give the total depth of rainfall considered captured by the BMP for the storm of interest.

Step 3 – Calculate the Percent Capture for Each Storm Event

The depth of rainfall captured during a given storm event is divided by the total depth of the storm to give the percent capture for the storm event that is used in the water quality model input.

Figure B-10 shows the percent capture estimates for a range of design rainfall intensities for in-line and off-line (or BMPs with bypass capability) swales.

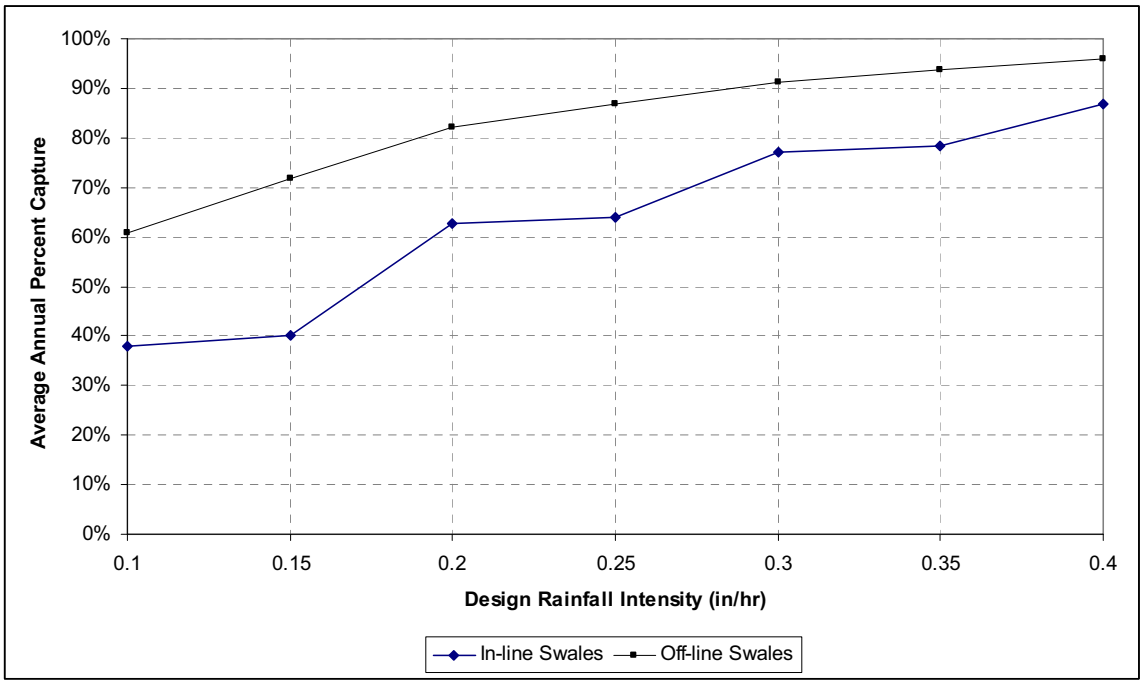

Figure B-10: Estimated Average Percent Capture for Swales as a Function of Design Rainfall Intensity

The percent capture results in the figure for the in-line swales are very conservative as the results assume no treatment of any flows when the design flow rate (resulting from the design rainfall intensity) is exceeded. In a real-world situation, treatment would still be effective when the design flow rate is minimally exceeded and some water quality improvements would be achieved even if the design flow rate were exceeded by a moderate amount. The net results is in-line swales design to provide water quality improvements for flow rates resulting from a rainfall intensity of 0.3 inches per hour is expected to provide effective treatment to 80 percent or greater of the stormwater runoff volumes.

Step 4 – Verify Percent Capture Estimates with SWMM

The above method is used as it provides an efficient method for estimating percent capture for each storm in the period of record, which is an input to the water quality model. SWMM is used to verify the results as it is considered to be more accurate than the above method due to the continuous simulation capability and the use of more detailed input parameters.

A SWMM run is conducted to simulate the drainage area (as described in Section B.2.2) tributary to the modeled BMP. The storage treatment block in SWMM is used to simulate the water quality flow rate in the swale by sizing the inflow pipe to the SWMM storage-treatment block. The SWMM results are then compared to the average annual capture results derived from the method above to verify that they are reasonably accurate, e.g. within a percentage point or two. Table B-17 demonstrates that the two methods provide comparable results. If the results from the above method do not agree closely with SWMM then the results can be calibrated. For example the flow capacity in the above method can be adjusted to derive results that closely match the SWMM results on an average annual basis.

B.2.5.1.3. BMP Capture Efficiency Results

The estimated capture efficiencies for the structural BMP in the Landmark Village treatment system are shown in

Table B-13 for the in-line swales and Table B-15 for the water quality basin.

BMP specifically designed to infiltrate stormwater runoff are not included in the stormwater management system. However, data in the International BMP Database (IBMPDB) have shown that as much as 30 percent of stormwater volume captured by dry extended detention basins and 35 percent captured by swales can be lost to infiltration (Strecker et al., 2004). Volume reductions achieved were conservatively modeled as 10 percent for the by the detention basin[1] and 25 percent for swale and bioretention BMPs.

[1] The average volume reduction was modeled as 10 percent as the basin will be lined to reduce infiltration and protect bank stability at the edge of the project in turn limiting the volumetric reduction of stormwater runoff.

Table B-13: BMP Percent Capture Estimate for Swales

Sizing Method	Design Precipitation Intensity (in/hr)	Capture Efficiency (%)[1]	Modeled Volume Reduction (%)
flow	0.30	80	25

1 – Capture efficiency was calculated with hourly rainfall data for each storm as described above and reported as an annual average.

Bioretention areas for the Landmark Village Project will use under-drains to minimize infiltration so as not to reduce the stability of the bank around the perimeter of the Project area.

Table B-14: BMP Percent Capture Estimate for Bioretention Areas

Sizing Method	Design Depth (in)	Capture Efficiency (%)[1]	Modeled Volume Reduction (%)
volume	Varies with imperviousness	80	25

1 – The bioretention will be sized to capture and treat 80 percent of the stormwater runoff on an average annual basis. The volume reduction, on an average annual basis, was modeled as equivalent to swales.

Table B-15: Percent Capture Estimates for the Water Quality Basin

BMP	Tributary Area (ac)[1]	% Impervious	Runoff Coefficient	Estimated Capture Efficiency (%) [1]	Modeled Volume Reduction (%)
WQ Basin	10.9	84	0.90	80	10

1 – The basin will be sized to capture and treat 80 percent of the stormwater runoff on an average annual basis. Continuous simulation modeling indicated a storage volume of approximately 1.1 acre-feet would be required for a maximum emptying time of 48 hours. If additional storage capacity is available in the water quality basin above that required for the current tributary area, additional areas may be routed to the basin to utilize the treatment capacity.

Treatment BMPs will be sized such that overall a capture efficiency of 80 percent or greater is achieved for the treatment of stormwater runoff from the Landmark Village Project.

B.2.5.2. BMP Pollutant Removal

Various data sources were examined to estimate the anticipated performance of the treatment BMPs. A comprehensive source of BMP performance information is the American Society of Civil Engineers (ASCE) International Stormwater BMP Database (ASCE, 2003, Strecker et al., 2001). The ASCE BMP database is comprised of carefully examined data from a peer-reviewed collection of studies that have monitored the effectiveness of a variety of BMPs in treating water quality pollutants for a variety of land use types. The mean effluent water quality for treatment BMPs used for modeling purposes was based on values found in the International Stormwater BMP Database (ASCE/EPA, 2003). Recent work in characterizing BMP performance suggests

that effluent quality rather than percent removal is more reliable in modeling stormwater treatment (Strecker et al. 2001).

To match site conditions, the BMP database studies were screened to exclude studies where BMP design or function was believed to result in significantly lower performance than the BMP design criteria that will be met for the Landmark Village BMPs. For example some of the detention basins studies had significantly lower maximum detention times than the 48 hour criteria for the water quality basins. The water quality data for detention basins with a drawdown time of less than 9 hours were excluded from the data set used to predict detention basin performance. Certain studies in the detention basins category were not considered comparable in function to the dry-extended detention basin that will be incorporated into the Landmark Village treatment system. Detention basins that were listed as either underground vaults or settling chambers were also excluded. All grass swales studies in the BMP database were deemed valid and were used in statistical analysis.

As with the estimation of land use EMCs, final effluent values to be used in modeling analysis were determined using a combination of regression on order statistics and the "bootstrap" method (see Section B.2.4.3).

Once the data had been screened for design criteria, the normality and lognormality of all BMP effluent sample data sets were tested using the Shapiro-Wilk goodness-of-fit test (Royston 1992). The majority of the pollutant data fit a lognormal distribution. The data that did not statistically fit the lognormal distribution were more closely approximated with a lognormal distribution than a normal distribution. The bootstrap method was applied differently depending on the distributional fit of the data. If the data fit a lognormal distribution, the log-transformed data were bootstrapped and an estimate of the mean and standard deviation were obtained in log space and then converted to arithmetic space. The assumption of lognormality was more stringently applied than normal by using an alpha significance value of 0.1. This was done to improve the estimate of the standard deviation when the assumption of lognormality fails. When analyzing data in log space there is a tendency to overestimate the standard deviation for relatively symmetric data and underestimate the standard deviation for severely skewed data. For datasets that did not fit the lognormal distribution, the raw data were bootstrapped to obtain the mean and standard deviation values. Bootstrapping the data in arithmetic space assumes no distribution in those instances when a distribution could not be confirmed through goodness-of-fit testing.

Table B-16 shows the lognormal effluent quality descriptive statistics for detention basins and swales. These values were estimated using the above procedure on the ASCE/USEPA International BMP Database data (ASCE, 2003). Note that data were not available for nitrite, ammonia for detention basins. Chloride removal was not simulated in the treatment BMPs.

Table B-16: Summary of Lognormal Effluent Quality Statistics & Arithmetic Mean Effluent Quality for Modeled BMPs.

Pollutant	Lognormal Modeling Parameters				Arithmetic Means	
	Detention Basins		Swales		Detention Basins	Swales
	Mean	St Dev	Mean	St. Dev		
TSS	3.503	0.709	3.089	0.821	42.7	30.7
Total P	-1.262	0.553	-1.340	1.051	0.330	0.455
NH3	NA	NA	-3.363	1.064	NA	0.061
NO3	-0.346	0.671	-1.394	1.108	0.886	0.459
NO2	NA	NA	-5.028	1.311	NA	0.015
TKN	0.460	0.522	0.336	0.593	1.81	1.67
Dissolved Cu	2.427	0.501	1.756	0.776	12.8	7.82
Total Pb	3.000	0.931	1.402	1.314	31.0	9.64
Dissolved Zn	3.786	0.705	3.231	0.714	56.5	32.6

NA - not available

B.2.6. Model Parameter Reliability & Assumptions

The input parameters for the water quality model fall into five main categories shown below. Each of the categories of input data is evaluated for accuracy reflecting the project site conditions.

- Rainfall data;
- Runoff Coefficients;
- Land Use data;
- Stormwater pollutant EMCs; and
- BMP performance estimates.

Rainfall Data: A limited period of record (about 12 years of hourly data) is available from the Castaic Junction gauge monitored by the LADPW. The Castaic Junction gauge is nearer to the project site and consistently measures precipitation amounts lower than recorded at the Newhall gauge. However, the limited period of hourly data the data collected at the Castaic Gauge is insufficient for water quality modeling and the rainfall data collected at the Newhall gauge was used. The rainfall data from the Newhall gauge are believed to overestimate the average annual rainfall by about 3 inches per year resulting in a conservative estimate of stormwater runoff volumes and changes in average annual volumes resulting from development.

Runoff Coefficients: The estimation of runoff coefficients, described in Section B.2.2, is highly dependant on soil properties (i.e. infiltration potential) and less dependant on parameters such as ET rates, slopes, and depression storage for example. Soil properties are estimated as accurately as possible from available data such as soil surveys and site specific geomorphology studies. The result is estimates for runoff coefficients that may somewhat overestimate or underestimate stormwater runoff. The net result on the water quality model is that this parameter is not conservatively estimated; however it is estimated as accurately as the available information

permits. When combined with the overestimate of average annual rainfall and land use percent impervious values (discussed below), stormwater runoff volumes are somewhat conservatively predicted.

Land Use Data: Land use data is the most accurately quantified input parameter. The data for the existing and developed conditions has a high level of accuracy for classifying land use type and area. The percent impervious values used in the water quality model for the urban land uses in the developed project condition are based upon the values listed in the LA County Hydrology Manual. These percent impervious values assigned to types of urban land uses are somewhat conservative to provide a margin of safety when estimating flow rates for flood control analysis. These same percent impervious values are used for calculating runoff coefficients estimates which results in a conservative estimate of stormwater runoff volumes.

Stormwater Pollutant EMCs: Stormwater pollutant EMCs are estimated from monitoring data collected by the LADPW from land use characterization stations that do not have the same level (if any) of site design and source control BMPs that will be implemented for the Landmark Village Project. Therefore the stormwater pollutant EMCs estimated from the LADPW data are probably slightly conservative compared to the pollutant concentrations in stormwater runoff that will occur from the developed conditions of the project site.

BMP Capture Efficiency & Effluent Concentrations: Stormwater capture efficiency estimates are calculated in Excel spreadsheets to provide results on a storm-by-storm basis for input into the water quality model. The method employed in the Excel calculations has been compared to percent capture estimate from SWMM modeling results which are believed to have a higher level of accuracy due to the continuous modeling approach. Table B-17 contains percent capture results from the Excel calculations described in Section B.2.5.1 and SWMM modeling. The SWMM percent capture estimates for detention basins were obtained directly from the storage-treatment block, (James and James, 2000). Results for the in-line and off-line swales were calculated with the SWMM flow rate output at 10-minute intervals for the period of record (01/01/1969 – 12/31/2003). Percent capture results calculated with the Excel method compare favorably to the results obtained with SWMM modeling. Overall the percent capture estimates for the structural BMPs are though to provide an accurate estimate of the average annual capture efficiency they will achieve once constructed.

Table B-17: Comparison of Percent Capture Estimates from Excel Calculations & SWMM Results

BMP	Sizing Parameters	Percent Capture Result	
		SWMM	Excel
Detention	1.1” design depth, 36 hour drain time	86.4	84.8
	1.3” design depth, 36 hour drain time	90.5	89.6
	1.1” design depth, 48 hour drain time	80.6	80.4
	1.3” design depth, 48 hour drain time	85.2	85.6

BMP	Sizing Parameters	Percent Capture Result	
		SWMM	Excel
Swale (off-line)	2.0 cfs, (runoff from 0.20"/hr)	83.2	82.2
	2.5 cfs, (runoff from 0.25"/hr)	87.8	86.9
	3.0 cfs, (runoff from 0.30"/hr)	91.9	91.3
Swale (in-line)	2.0 cfs, (runoff from 0.20"/hr)	62.1	62.7
	2.5 cfs, (runoff from 0.25"/hr)	66.0	64.1
	3.0 cfs, (runoff from 0.30"/hr)	77.2	77.1

BMP effluent concentrations are based on studies contained in the International BMP database. These studies are screened to remove data for undersized (i.e. inadequate design criteria) BMPs that are likely to have pollutant removal performance substantially less than the BMPs to be constructed for the Landmark Village Project. This screening is believed to improve the accuracy of BMP performance estimates; however it is only intended to remove BMPs that are clearly under designed. The screening process is intended to include BMPs with adequate performance that may not be as well designed or maintained as the structural BMPs that will be part of the stormwater management system. It is anticipated that the BMPs for the Landmark Village project will perform as well, if not a little better than, the estimated BMP performance. BMP pollutant removal does not include the effects of site design or source control BMPs that will help the overall effectiveness of the stormwater management system that will be incorporated into the Landmark Village Project site.

Conclusions: The runoff coefficient, land use type & area, and BMP performance model input parameters are thought to be reasonably accurate representations of the real world conditions and do not increase the conservativeness of the water quality model. The rainfall data, land use percent impervious values, and stormwater pollutant EMC estimates are believed to result in conservative estimates of stormwater runoff volumes, pollutant concentrations and therefore pollutant loads. Overall the model input parameters likely result in conservative estimates of water quality. The water quality estimates for the developed project condition are believed to be a little more conservative due to the land use imperviousness values, pollutant concentration estimates, and BMP performance estimates that do not include the benefits of site design or source control BMPs.

B.3. Model Methodology

A Monte Carlo simulation method was used to develop the statistical description for water quality of storm water. In this approach, the storm water characteristics from a single arbitrary rainfall event are first estimated. The rainfall depth of an arbitrary event was determined by randomly sampling from the historical rainfall information. Similarly, an arbitrary EMC was determined by randomly sampling from the distribution of EMCs in a manner that preserves the mean and standard deviation of the monitoring information. The randomly determined rainfall volume and EMC were used to determine runoff volume, pollutant concentration, and pollutant load of a single arbitrary storm event. Finally the BMP performance (effluent quality) is

randomly determined to calculate the pollutant removal resulting from treatment in the BMP system. This procedure was then repeated thousands of times (20,000), recording the volume, EMC and load from each random storm event, without and with treatment for the developed project condition. The statistics of these recorded results provides a description of the average characteristics and variability of the volume and water quality of storm water runoff. The modeled Pollutants were:

- Total Suspended Solids (sediment)
- Total Phosphorus
- Ammonia
- Nitrate
- Nitrite
- Total Nitrogen[2]
- Dissolved Copper
- Total Lead
- Dissolved Zinc
- Chloride

The steps in the Monte Carlo Water Quality Model are as follows:

1. Develop a statistical description of storm events and pollutant concentration in storm runoff, as necessary.
2. Estimate the volume of storm runoff from a random storm event for each land use area.
3. Estimate a random pollutant concentration in storm runoff for each land-use area.
4. Calculate the total runoff volume, pollutant load, and concentration in runoff from the modeled portion of the project.
5. Calculate the water quality improvements achieved in the structural BMPs (usually developed conditions only).
6. Estimate a random number of storms per year based on available historical records. To estimate a single random annual load, repeat steps 2 - 5 by the random number of storms per year, summing the loads from each random storm event.
7. Repeat steps 2 - 6 a total of 20,000 times for each pollutant modeled, recording the estimated pollutant concentration and annual load for each iteration.
8. Develop a statistical representation of the recorded storm water loads and concentrations.

Each of the eight steps is described below.

[2] TKN is modeled, but the results are not reported. Total Nitrogen results are reported from the sum of nitrate, nitrite, ammonia, and TKN.

B.3.1. Storms & Stormwater Runoff (steps 1 & 2)

Step 1 – Statistical Representation of Storm Events

Storm Depth

An arbitrary storm depth was determined by randomly sampling from the population of 538 storms generated by the rainfall analysis. The historical record of storm depths was sampled such that each storm had an equal chance of being selected.

Number of Storms per Year

The number of storm events per year was calculated for the 35 complete years in the available period of record from 1969 – 2003. The modeled average number of storm events per year (> 0.1 inches) was 15.4, with a standard deviation of 6.2. Figure B-11 illustrates a frequency histogram of the number of storm events per year at the Newhall gauge. The number of storm events per year was modeled with a normal distribution.

In the simulation, the number of storms per year was determined by randomly sampling from the normal distribution (~N (15.4, 6.2)) and rounding to the nearest whole number. If the arbitrary number of storms per year was zero or negative, then the normal distribution was re-sampled until a positive number was obtained.

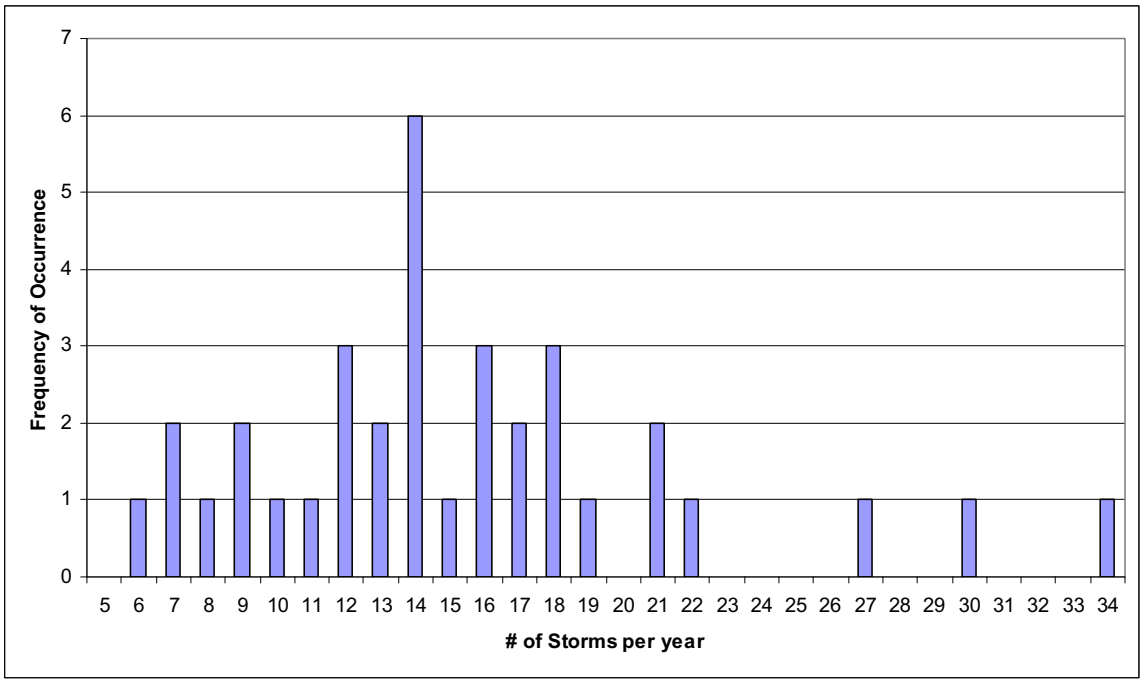

Figure B-11: Distribution of Storms per Year at the Newhall Gauge.

Step 2 – Estimate the Volume of Storm Runoff from a Random Storm Event.

The runoff volume from each storm was estimated with the following modification to the Rational Formula:

$$Q = R_v PA \tag{5}$$

where:

Q = the stormwater runoff volume (ft^3/year)

P = the rainfall depth of the storm (ft)

A = the drainage area (ft^2)

R_v = the mean volumetric runoff coefficient, a unit-less value that is a function of the imperviousness of the drainage.

- Existing Conditions: Runoff Coefficient = 0.0092 × % Impervious + 0.035
- Developed Conditions: Runoff Coefficient = 0.0089 × % Impervious + 0.063

For sub-basins that contain multiple land-use types, the total stormwater runoff volume is determined as the sum of runoff from each land-use type:

$$Q_{total} = \sum_{lu} Q_{lu} = R_{v\,lu} PA_{lu} \tag{6}$$

where *lu* designates the land-use type. It is assumed that rain falls uniformly over all land-uses in the sub-basin.

The steps used to calculate the volume of runoff from a random storm event were:

Step 2a Obtain a rainfall depth by randomly sampling from the 538 storm events.

Step 2b For each land-use area calculate a runoff volume using equation (5). The same rainfall depth is applied to each land-use area.

Step 2c Sum the runoff volumes from each land-use area to obtain the total runoff from the watershed for a particular storm event with equation (6).

B.3.2. Pollutant Loads & Concentrations (step 3 & 4)

Step 3 – Estimate a Pollutant Concentration in Storm Runoff from Each Land Use Area

Runoff Concentration

The distribution of land use-based pollutant concentration in storm runoff was obtained from targeted monitoring data collected in Los Angeles. Because only summary statistics were employed, it was assumed that the pollutant concentrations from all land-use areas are log-normally distributed. This assumption was evaluated by Los Angeles County using the Shapiro-Wilk Normality Test (LA County, 2000). For most cases the monitoring data were lognormally distributed, although in some instances the data were better fit with a normal distribution or were neither normally nor lognormally distributed. Stormwater EMCs were sampled randomly for each modeled land use and water quality parameter from the developed lognormal distribution parameters (see Section B.2.4) for each modeled storm event.

The pollutant concentration in storm runoff from each land-use area was estimated by randomly sampling from the associated concentration distribution (lognormal) estimated from the LA

County monitoring data. The runoff concentration from each land-use area was evaluated with the expression:

$$C_{land-use} = \exp\left(\mu_{\ln x} + \sigma_{\ln x} R_N\right) \quad (7)$$

where:

$\mu_{\ln x}$ = the log-normal mean

$\sigma_{\ln x}$ = the log-normal standard deviation

R_N = a standard normal random variable

Implicit in these calculations is the assumption that runoff concentration is independent of rainfall depth, and is also independent of runoff concentration in neighboring land-use areas. Environmental Defense Sciences (2002) examined the validity of the first assumption. They found that there was not a strong correlation between rainfall volume and event mean concentrations (EMCs) in the LA County data for education land-uses.

Step 4 – Calculate the Total Runoff Volume, Pollutant Load, and Pollutant Concentration in a Random Storm Event

Step 4A - The total runoff volume in the watershed was calculated with equation (6) as discussed in Step 2:

$$Q_{total} = Q_{land-use1} + Q_{land-use2} + \ldots + Q_{land-usei} \quad (8)$$

where the same random rainfall event was used to calculate runoff volume in each of the land-use areas.

Step 4B - The total pollutant load was calculated by:

$$L_{total} = Q_{land-use1} C_{land-use1} + \ldots + Q_{land-usei} C_{land-usei} \quad (9)$$

where the runoff from each individual land-use area was calculated with equation (5) discussed in step 2, and the concentration in each individual land-use area was calculated with equation (7) discussed in step 3.

The developed condition with treatment used additional calculations to determine the reduction in pollutant load and concentration achieved by treatment. The fraction of stormwater runoff receiving treatment was calculated for each storm event and runoff volume flowing to each BMP. That is, each storm event has an associated capture efficiency for the BMPs providing treatment. BMP performance was modeled with the randomly determined effluent concentration achieved within the BMP for each water quality Pollutant.

$$L_{total} = \left[Cap_{\%} \times Q_{land-use} \times C_{eff} \times \left(1 - VR\%\right)\right] + \left[\left(1 - Cap_{\%}\right) \times Q_{land-use} \times C_{land-use}\right] \quad (10)$$

where:

$Cap_{\%}$ is the percent capture of the BMP. For the modeled BMPs the $Cap_{\%}$ is volume based.

C_{eff} is the randomly determined effluent concentration from the BMP. For the swales and water quality basins, C_{eff} was determined from sampling from the lognormal distribution described by the parameters contained in Table B-11.

VR% is the percent reduction in effluent volume achieved by the BMP (see Section B.2.5.1.3).

Step 4C - The average pollutant concentration in runoff from the entire watershed from a single storm event was calculated by dividing the total watershed load by the total watershed runoff volume:

$$C_{total} = L_{total} / Q_{total} \quad (11)$$

where the runoff from individual land-uses is calculated from step 2 and the concentration in individual land-uses in calculated by step 3.

B.3.3. Pollutant Loads & Concentrations Leaving Project Site (steps 5 to 8)

Step 5 – Calculate a Random Total Annual Pollutant Load

The annual pollutant load is simply the sum of pollutant loads generated from all storms in a given year. Thus, to compute an annual pollutant load, the number of storms in a random year must first be determined. This was accomplished by randomly sampling from the distribution using the expression:

$$N_{storms} = 15.4 + 6.2 R_N \quad (12)$$

where:

R_N = a standard normal variant with a mean of 0 and a standard deviation of 1

The number of storms was rounded to the nearest whole number, and in cases where zero or a negative number of storms was obtained, the distribution was re-sampled until a positive number was obtained (years without any storms did not occur in the available period of record so this situation was not simulated in the water quality model).

Next, steps 2-4 were repeated N_{storms} times, recording the total pollutant load from each random storm event. Finally, the individual storm loads were summed to obtain the total annual pollutant load.

Step 6 & 7 – Determine Distribution of Storm Concentration and Annual Loads

Steps 2-5 were repeated a total of 20,000 times, recording the pollutant concentration and annual load from each iteration. The resultant distributions can be used to present frequency distribution for pollutant concentrations or loads using statistics calculated from the 20,000 Monte-Carlo iterations.

Step 8 – Develop a statistical representation of the recorded storm water loads and concentrations

Results from the 20,000 Monte-Carlo iterations are average to provide the average annual stormwater load and concentrations results presented in the water quality assessment report.

B.3.4. Model Methodology Assumptions

Five core assumptions are made for the Monte Carlo water quality modeling methodology:

1. The assumed probability distributions of model parameters;
2. The assumption of independence between model parameters (i.e. no correlation between randomly determined variables);
3. Assigning a Lower Limit to BMP Effluent Concentrations;
4. Limiting pollutant removals to Pollutants with data; and
5. Modeling structural BMPs to removing pollutants only and not acting as a source.

Each of these assumptions is discussed in detail below.

1) Distribution Assumptions: Probability distributions are assumed to represent the number of storms per year, stormwater pollutant concentrations, and BMP effluent concentrations. Observed rainfall data (i.e. storm frequency) and stormwater monitoring data are fit with either a normal or lognormal distribution using standard statistical procedures. The distribution applied to the model parameters influences the sampling result (i.e. the frequency at which values within different magnitude ranges are selected). The type of distribution believed to best represent each model parameter was used in the model to determine random estimates of the input variables such that a large sample of these estimated variables will have same mean and variance that was observed in the rainfall and monitoring data.

Storms per Year: Figure B-11 shows the number of storms per year occurring at the Newhall rain gauge (augmented with data from the San Fernando gauge). The number of storms occurring per year at the Newhall gauge appears to lie between the normal and lognormal distributions. The normal distribution was used to determine the number of storms per year simulated in the water quality model as use of the lognormal distribution would overestimate the average annual rainfall, as well as its variability, when the distribution of the data is not heavily skewed. As discussed in Section B.2.6, use of rainfall data collected at the Newhall gauge already tends to overestimate the average annual rainfall for the Project site. When using the normal distribution to randomly determine the number of storm per year, the resulting average annual rainfall output from the water quality model is typically in the range of 17.9 to 18.0 inches per year. This is in close agreement with the average annual rainfall from runoff producing storms of 17.9 inches determine directly from the rainfall data (see Table B-1).

Stormwater Pollutant Concentrations: The Shapiro-Wilk Test was used to determine the statistical distribution that best represents the raw stormwater monitoring data collected in Los Angeles and Ventura Counties. In most instances the data were found to be log-normally distributed at a confidence level of 0.10. In some instances, the data were not fit by either the normal or lognormal distributions, but were found to be more closely approximated by the log-normal distribution. For data sets with greater than 50 percent non-detects or that were not log-normally distributed according to the Shapiro-Wilk test, data were analyzed in arithmetic space as to not unreasonably overestimate the standard deviation of the data set. Since stormwater pollutant concentrations, in general, tend to be well approximated by the lognormal distribution (Helsel and Hirsh, 2002), the data sets that did not meet the lognormal criterion are still believed to belong to a log-normally distributed population, but the number of data points is too few to

statistically confirm that this is the case. Therefore, simulations of stormwater concentrations in the water quality model were still conducted in lognormal space. This assumption is not believed to appreciably contribute to the conservativeness of the water quality model. Also the application of the lognormal distribution to determine all pollutant EMCs is believed to result in a more accurate prediction than would the application of the normal distribution.

BMP Effluent Concentrations: Goodness-of-fit tests conducted on the raw BMP effluent monitoring data from the International BMP Database with the Shapiro-Wilk Test either resulted in confirmation of the appropriateness of the lognormal distribution for the data or in the instances when the data did not meet the significance criteria of a p value > 0.1 the data were more closely approximated with the lognormal distribution than the normal. The use of the lognormal distribution to represent BMP effluent concentrations results in higher average estimates of BMP effluent concentration. This is believed to be a more accurate estimation of BMP performance than use of the normal distribution, and is considered to provide a conservative bias in the model results.

<u>2) Assumption of No Correlation between Model Parameters</u>: The water quality model randomly samples for stormwater pollutant concentrations independent of the storm depth or antecedent dry period. The validity of this assumption is supported by analyses conducted by Environmental Defense Sciences (2002) who did not find a strong correlation between rainfall volume and event mean concentrations (EMCs) in the LA County data for education land-use. Data analyses for the single family residential land use were found to be weakly correlated (R^2 of 0.6 ± 0.1) for some pollutants with storm depth; however some pollutant showed little correlation between these variables. Where weak correlations were present, stormwater pollutant concentrations decreased with storm size which is a reasonable expectation as more rainfall would result in greater dilution of the pollutants available for wash-off.

Correlations between pollutant concentration and antecedent dry period were similarly variable. For the single family land use correlations between pollutant concentration and antecedent dry period were moderately significant for a few pollutants (R^2 of 0.8 ± 0.03), and weak for other pollutants. Correlations between pollutant concentration and antecedent dry period varied widely for the educational and multi-family land uses.

The results of these analyses indicated that no consistent level of correlation was determined between the stormwater EMCs and the rainfall depth or the antecedent dry period and weak or no correlation was found for most pollutants and land-use. On this basis, stormwater pollutant concentrations are sampled independent of storm depth and antecedent dry period in the water quality model. Consequently the mean and variance observed in the stormwater data will be preserved in the runoff concentrations that are estimated with the water quality model. In addition, this assumption results in conservative estimates of pollutant loads in the water quality model as pollutant concentrations are not constrained for the larger storm events or shorter antecedent dry periods.

Effluent concentrations are considered more reliable estimator of treatment performance than percent removal (Strecker et al. 2001). BMP effluent concentrations were sampled independently of stormwater concentrations (i.e. influent concentration to the BMP) in the water quality model. As with the pollutant EMCs, independent sampling of effluent concentrations preserves the mean and standard deviation in the monitoring data. The result of this assumption is that it does not limit the variability of pollutant concentrations and loads predicted by the model that would occur if the effluent concentration was correlated with the influent concentration. Due to the large number of iterations in the model and independent sampling for the EMC and BMP effluent distributions, this assumption is expected to result in a reasonable representation of average stormwater concentrations, BMP performance, and overall annual conditions in the model output.

3) BMP Performance – Irreducible Pollutant Effluent Concentrations: When sampling from the lognormal distribution to estimate BMP performance with an effluent concentration it is possible to select values approaching or equal to zero. While well functioning BMPs are capable of achieving high rates of pollutant removal, it is generally accepted that BMPs usually cannot completely remove pollutants from the water column. In effect BMPs can achieve what is called an "irreducible pollutant concentration" (Schueler, 1996). In an effort to prevent the water quality model from overestimating BMP performance lower limits were set for the effluent concentrations of each modeled pollutant and BMP. The lowest observed effluent value in each pollutant data set was used as the irreducible pollutant effluent concentration in the water quality model. This assumption is expected to provide a more accurate representation of BMP performance, and to prevent the estimation of unrealistic effluent quality achieved in the modeled BMPs.

4) BMP Performance – Limiting Pollutant Removal Estimates to Available Data: Table B-16 presents model parameters for estimating BMP pollutant effluent concentrations. Pollutant removal is only simulated for those Pollutants with available data from the IBMPDB. As data is not available for ammonia or nitrate effluent concentrations for dry-extended detention basins, removal of these pollutants is not modeled for this BMP. While chloride data is available for swales, because this Pollutant is water soluble and is not a nutrient for plants (i.e. is not likely to exhibit significant uptake) no chloride removal is credited in the BMPs. Limiting the simulation of pollutant removal only to pollutant / BMP combinations with available data prevents overestimating BMP performance for those Pollutants.

5) BMP Performance – BMPs are not a Source of Pollutants: In instances when the randomly determined BMP effluent concentration exceeds the modeled influent concentration, no pollutant removal occurs and the effluent concentration is modeled as equal to the influent. This prevents BMPs from acting as a source of pollutants in the water quality modeling. The commitment to regular and effective maintenance of the stormwater BMPs provides support for this assumption; however it is not the primary reason for this function of the water quality model.

Stormwater pollutant concentrations and BMP effluent concentrations are randomly and independently determined in the model. The greater the overlap between the EMC distribution for a pollutant and the BMP effluent distribution the closer the average values and the lower the

overall pollutant removal simulated by the water quality model. The greater the overlap between these distributions also makes it more likely that sampled effluent concentration would be higher than the EMC (i.e. influent concentration). Therefore the less removal simulated for a given pollutant and less accumulation of that pollutant in a BMP the more likely it is that the BMP would act as a source of this pollutant in the model. This limitation of the water quality model tends to overestimate the pollutant loads for Pollutant that occur at low concentrations in stormwater runoff and / or are not effectively removed by stormwater BMPs. Preventing BMPs from acting as a source of pollutants in the modeling methodology is believed to more accurately estimate pollutant loads transported from the project site and prevents overestimation of some water quality Pollutants such as total lead.

Conclusions: The assumptions for the water quality modeling methodology described above generally do not contribute to the conservativeness of the model as is the case for the estimation of model input parameters as described in Section B.2.6. Furthermore, the method assumptions are not believed to contribute to over estimating BMP performance or under estimating stormwater pollutant concentrations or loads leaving the project site. The above assumptions are expected to improve the accuracy of the water quality model estimates. The net result for the model outputs are somewhat conservative estimates of pollutant loads and concentrations due to estimation of model input parameters that are not compromised by the model methodology.

B.4. Model Reliability

Factors that affect model reliability include variability in environmental conditions and model error. To account for environmental variability, a statistical modeling approach was used that takes into account the observed variability in precipitation from storm to storm and from year to year. The model also takes into account the observed variability in water quality from storm to storm, and for different types of land uses. One way to express this variability is the coefficient of variation (COV) which is the ratio of the standard deviation of the variable to the mean value. Based on the statistical model, the range of COVs for pollutant loads was from 0.5 to 0.8 on an average annual basis, depending on the Pollutant. This variability, or greater is expected in typical storm water runoff.

Model error relates to the ability of the model to properly simulate the processes that affect storm water runoff, concentrations, and loads. Ideally model error is measured through calibration, but calibration is not feasible when considering a future condition. We are confident that the model is a reasonable reflection of storm water processes because the model relies largely on measured regional data. For example, the runoff water quality data are obtained from a comprehensive monitoring program conducted by LA County that has measured runoff concentrations from a variety of land use catchments and for a statistically reliable number of storm events. In addition parameter estimation is fairly conservative resulting in moderately conservative estimates of pollutant concentrations and loads

B.5. References

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C. APPENDIX C: TREATMENT BMP SIZING CRITERIA FOR THE NEWHALL RANCH PROJECT

The purpose of this appendix is to provide treatment BMP sizing and design criteria guidance for the Landmark Village Project. Methods and criteria used to size vegetated swales and dry extended detention ponds. Figures are provided to assist in the preliminary determination of area requirements for the various BMPs. The size of the facilities should be finalized during the design stage by the project civil engineer with the final hydrology study, consistent with these sizing criteria.

C.1. SUSMP BMP Sizing Requirements

The County of Los Angeles' Standard Urban Stormwater Mitigation Plan (SUSMP) contains specific sizing criteria for stormwater treatment BMPs for new development and significant redevelopment projects. The SUSMP includes sizing criteria for both volume-based and flow-based BMPs. The sizing options for volume-based BMPs, such as extended detention basins, are as follows:

1. The 85th percentile 24-hour runoff event storm event determined as the maximized capture stormwater volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (WEF, 1998); or,

2. The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/Commercial (CASQTF, 1993); or,

3. The volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a stormwater conveyance system; or,

4. The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County Area) that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile, 24-hour runoff event.

Volume-based treatment control BMPs for Landmark Village Projects will be sized to capture and treat 80 percent of the annual runoff volume, with a drawdown time of 48 hours. This methodology is consistent with criteria two above.

Flow-based BMPs such as vegetated swales and hydrodynamic separation systems (e.g., CDS) units must be designed to infiltrate or treat the maximum flow rate generated from one of the following scenarios:

1. The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity, or

2. The flow of runoff produced from a rain event equal to at least two times the 85th percentile hourly rainfall intensity for Los Angeles County, or

3. The flow of runoff produced from a rain event that will result in treatment of the same portion of runoff as treated using volumetric standards above.

Flow-based BMPs for Newhall Land projects will be sized using a rainfall intensity of 0.3 inches per hour, which will provide for 80 percent capture or more of the annual runoff volume, in compliance with criteria three above.

C.2. Volume-Based BMP Sizing Methodology

Volume-based treatment BMPs (e.g. dry extended detention basins) are designed to treat a volume of runoff, which is detained for a certain period of time to effect settling of solids and associated pollutants. The storage-treatment block of SWMM model can be used to predict the capture efficiency of an individual BMP or to generate percent capture curves for a range of BMP sizes that can then be used to predict the average capture efficiency of the BMP(s) to be modeled. The sizing of the dry extended detention basin for the Landmark Village Project will result in treatment of 80 percent of the annual runoff volume, as determined using SWMM (Storm Water Management Model) with a 48-hour drawdown time. The water quality model used results for individual storms resulting in a corresponding level of treatment.

Model inputs for this type of simulation with SWMM are hourly rainfall data, drainage basin parameters (Table C-1), and BMP parameters. Long-term hourly data from Newhall gauge, with data gaps filled through correlation to the San Fernando gauge are used as the rainfall input for the Newhall projects. The rainfall data is used with other tributary area parameters to generate stormwater runoff routed to the BMP. Slopes and soils properties are the main inputs that will tailored for the individual tributary areas to BMPs.

Table C-1: Example SWMM Runoff Module Parameters

SWMM Runoff Parameters	Units	Values
Wet time step	Seconds	600
Wet/dry time step	Seconds	600
Dry time step	Seconds	14,400
Impervious Manning's n		0.012
Pervious Manning's n		0.25
Drainage area	acres	5 - 100
Shape		Rectangular, 500 ft flow length for pervious areas, 250 ft flow length for impervious area
Slopes	Ft/ft	Varies based on a tributary area
Evaporation	In / month	May vary based on a tributary area, suggest using consistent values for entire project area.
Soil properties / Infiltration		Green-Ampt parameters, varies based on soils of the tributary area.
Depression storage, Impervious	Inches	0.02, based on Table 5-14 in SWMM manual
Depression storage, Pervious	Inches	0.06, based on Table 5-14 in SWMM manual
Initial Soil moisture deficit		0.32 (porosity – moisture content)

Once the stormwater runoff is generated with the local rainfall data and simulated drainage area, the flows are routed to the BMP for estimating the capture efficiency. In SWMM, a volumetric BMP is represented with a series of stage discharge curves that represent the basin volume and outflow rate. Stormwater runoff is considered captured by the BMP until the storage volume is filled with subsequent storm flows, resulting in bypass, until storage capacity is created in the BMP through drawdown.

Numeric sizing criteria for volume-based controls are presented in the form of curves that plot the basin size, expressed as unit basin storage volume (for dry extended detention basin, see Figure C-1) or percent drainage area (for bioretention area, see Figure C-2), corresponding to 80% capture, as a function of site percent imperviousness. Figure C-1 assumes a 48-hour drawdown time.

C.3. Flow-Based BMP Sizing Methodology

Flow-based BMPs are typically sized to capture and treat a flow rate resulting from a design rainfall intensity expressed as inches per hour. Flow-based BMPs for Newhall Land Projects

should be sized using the rational method with the simple method runoff coefficient equation[3] and a design rainfall intensity of 0.3 inches per hour. This methodology will result in treatment of approximately the same fraction of runoff treated as using the volumetric guidance above.

C.4. Treatment BMP Design Criteria

Treatment BMP design criteria and guidance are contained in Appendix B of the LA County SUSMP (LACDPW, 2002) and the LA County Technical Manual for Stormwater BMPs (LACDPW, 2004). The latter guidance document relies on, and has similarities to, design information in the California BMP Handbook for New Development and Redevelopment prepared by the California Stormwater Quality Association (CASQA, 2003). Engineering judgment was used in selecting design criteria where there are inconsistencies between the two LA County documents, and also between the LA County documents and the California BMP Handbook.

C.4.1. Dry Extended Detention Basin Design Criteria

The following sizing criteria are for dry extended detention basins:

- ***Design Volume***. Determine the design storage volume (using the California Stormwater BMP Handbook sizing method outlined above) for 80 percent runoff volume capture. Add any additional volume as needed for flow or flood control (different outlet structure for this volume as well).

- ***Sediment Accumulation***. The LA County SUSMP Manual specifies a 20 percent overage in the design volume to accommodate sediment accumulation. In contrast the LA County Stormwater Manual (LACDPW, 2004) does not include a design overage for sediments. Recent evaluations of design criteria for detention basins (Minton, 2004) indicates that a 20 percent overage is not cost-effective, given that sediment accumulation rates are on the order of 0.25-0.5 in/yr. Minton (2004) recommended that this design criterion be eliminated. Using information from the LA County Stormwater monitoring database, analysis was conducted to assess the likely sediment accumulation rates in detention basins that treat urban runoff. Using the highest Even Mean Concentration for TSS from urban land uses (178 mg/L from industrial areas), average accumulation was estimated to be on the order of 2.5 percent of the basin volume in 20 years, and about 6 percent of the basin volume after 50 years. Based on this analysis, five percent overage for sediment accumulation is included in the sizing criteria. This overage will be incorporated into a sediment forebay, which should be included in the final basin design.

[3] Runoff Coefficient = 0.9 × % impervious + 0.05

- ***Detention Time***. The LA County SUSMP specifies a 24 to 48-hour emptying time, whereas the LA County Stormwater BMP Manual (LACDPW, 2004) specifies a drawdown time of 72 hours. For comparison, the California BMP Handbook suggests a 48-hour drawdown period. It is expected that longer detention times (72-hours) provide better treatment, especially for finer particles, but would require larger basins to achieve equivalent levels of percent capture (i.e. volume of total runoff treated). This level of treatment may not be cost-effective, or necessary, therefore use a 48-hour drawdown time.

- ***Outlet Structure and Emptying Time.*** An extended detention perforated riser outlet structure (or equivalent functioning outlet) will be used to drain the basin. The LA County SUSMP specifies that no more than 50 percent of the basin volume may be released in 12 hours. To conform with the SUSMP requirements, the riser structure should be designed to release the bottom 50 percent of the detention volume (half-full to empty) over 32 hours, and the top half (full to half-full) in 16 hours. This design provides longer detention periods and greater treatment for runoff from the more frequent smaller storm events.

- ***Basin Geometry.*** A trapezoidal basin geometry should be assumed for purposes of determining the preliminary, planning-level basin sizes. The LA County SUSMP specifies that the basin side slopes should be no steeper than 4:1 (H:V), and that the length-to-width ratio should be not less than 4:1. Alternatively, the LA County Stormwater BMP Manual (LACDPW, 2004) specifies a minimum basin side slope of 3:1, and a minimum length-to-width ratio of 1.5:1. To develop conservative estimates for space requirements, side slopes should be set at 3:1 for sizing calculations. The length-to-width ratio at the average basin height should be a minimum of 1.5:1, but preferably at least 2:1. When more specific designs are developed, internal berms may be employed to achieve the desired length-to-width ratios. If steeper side slopes are necessary, fences should be used for safety purposes.

- ***Basin Depth.*** The LA County Stormwater BMP Manual (LACDPW, 2004) and the California Stormwater BMP handbook (CASQA, 2003) both recommend an optimum basin depth of 2-5 feet, but neither specify a recommended maximum depth. For considerations of practicality, use a basin depth of 4 to 5 feet. Deeper basins may be used if necessary due to site/space constraints, but may trigger dam safety requirements so are not desirable.

- ***Spillway and Freeboard.*** The basin must include an emergency spillway or other appropriate release method(s) to safely discharge flows in excess of design volume. The LA County SUSMP specifies that the spillway structure should be designed in

accordance local drainage criteria. For sizing calculations, a freeboard depth of 1-foot above the design pool should be used for all berms.

Table C-2: Summary of Dry Extended Detention Basin Design Criteria

Design Criteria	Recommendations
Volume Requirements	Basin volume required to treat 80 percent runoff with an average drawdown time of 48-hours (estimated by continuous SWMM simulation, see Figure C-1 below)
Impervious percentage	See 2002 LA County Hyd Manual Addendum Appendix F MFR Imp = use 0.682 to 0.855 SFR Imp = use 0.418 COM Imp = use 0.909 to 0.985 IND Imp = use 0.473 to 0.958 INST Imp = use 0.473 to 0.819
Design Volume	Basin Size = Unit Basin Size x Drainage Area
Forebay size	V_f = Basin Volume x (0.05 to 0.1)
Length to Width Ratio	Use length to width ratio R = 2:1 (min 1.5:1)
Side Slopes	Use Z = 3
Depth	D = 4 – 5 ft (or as site constraints require)
Basin Freeboard	Use f = 1ft
Basin Geometry	$V = LWD + (L+W) \times Z \times D^2 + (4/3) \times Z^2 \times D^3$
Basin Bottom Width	1. W = L/2 or 2. $W = (-(R+1) \times ZD^2 + \text{sqrt}((R+1)^2 \times Z^2 \times D^4 - (16/3) \times RZ^2D^4 + 4RDV)) / 2RD$
Basin Bottom Length	L = 2 x W
Basin Top Width	$W_t = W + 2(D + f)Z$
Basin Top Length	$L_t = L + 2(D + f)Z$
Surface area	$A_s = W_t \times L_t$
Area Ratio	$R = A_s/A$

C.4.2. Vegetated Swale Design Criteria

Vegetated swales can be designed to be either on-line or off-line. On-line swales are used for conveying high flows as well as providing treatment of the water quality design flow. Off-line swales have flows up to the water quality design flow diverted to them from the conveyance system. On-line swales are sized so that the low flow portion of the swale meets the treatment BMP design criteria, and the upper portion of the swale conveys high flows (e.g. flood conveyance), with a set freeboard (per the LA County Hydrology Manual, Los Angeles County 1991). An exception to the required freeboard are inlets or safe surface conveyances to carry excess water into a storm drain system, that might occur in parking lots for example. Off-line

swales only provide freeboard if space is available. The following design criteria should be used for sizing vegetated swales:

- ***Design Rainfall Intensity***. The 85th percentile rainfall intensity for the Newhall rain gauge is 0.2 inches per hour. The design rainfall intensity that will be used for Newhall Land projects is 0.3 in/hour, to account for higher rainfall intensities not apparent in the hourly rainfall data and help achieve higher capture efficiencies.

- ***Longitudinal Slope***. The recommended longitudinal slope is 1 to 6 percent in the LA County SUSMP. The LA County Stormwater BMP Manual (LACDPW, 2004) recommends a maximum slope of 2.5 percent, but additionally states that slopes in the range of 2 to 5 percent can be managed with a series of small check dams. The use of check dams would also promote additional infiltration (LACDPW, 2004). For sizing calculations, the longitudinal slope is assumed to range between 1 to 6 percent, and if necessary, check dams would be used in the final design to reduce slopes and velocities to acceptable limits.

- ***Swale Geometry***. A trapezoidal channel shape should be assumed for sizing calculations, as recommended in both the LA County SUSMP and the LA County Stormwater BMP Manual (LACDPW, 2004).

- ***Side Slope***. The LA County Stormwater BMP Manual specifies a minimum side slope of 3:1 (H:V), whereas the LA County SUSMP specifies a minimum side slope of 2:1 and an optional side slope of 4:1. Swales designed for water quality treatment purposes only are anticipated to be fairly shallow, generally less than 1-foot. Therefore, a side slope of 2:1 (H:V) can be used for sizing calculations. Less steep slopes are preferable for traditional grass swales that need to be mowed.

- ***Hydraulic Residence Time and Swale Length***. Design criteria in the LA County SUSMP state that the swale length should provide a minimum residence time of 5 minutes and an optimal residence time of 9 minutes. The LA County Stormwater BMP Manual (LACDPW, 2004) recommends a swale length that provides a minimum hydraulic residence time of at least 10 minutes. Both manuals specify a minimum swale length of 100 feet. A minimum hydraulic residence time of 10 minutes and a minimum length of 100 feet should used for sizing calculations. If a length of 100 feet cannot be achieved (e.g., parking lot situations), then bioretention areas are an alternative (see below).

- ***Flow Depth.*** The LA County SUSMP recommends a design depth of flow of 3 to 4 inches. Similarly, the LA County Stormwater BMP Manual (LACDPW, 2004) states that

the depth of flow not exceed 2/3 of the grass-height, which is recommended at 6 inches. For sizing calculations, the depth of flow should be set to a maximum of 4 inches.

- ***Swale Width***. The LA County SUSMP recommends a bottom swale width of 2 to 8 feet, with a maximum width of 10 feet. The LA County Stormwater BMP Manual recommends a maximum bottom of 10 feet. For sizing calculations, the maximum swale bottom width should be limited to 10 feet.

- ***Freeboard.*** Swales that are required to convey flood as well as water quality flows should be sized to meet the flood conveyance standard and include 1 feet of freeboard above the water quality depth (per the SUSMP Manual), unless it can be demonstrated that the swale freeboard is not needed as runoff would be safely conveyed to a drainage system.

Table C-3: Vegetated Swale Design Criteria

Design Criteria	Recommendations
Design Intensity	I = 0.3 in/hr
Impervious percentage	See 2002 LA County Hyd Manual Addendum Appendix F MFR Imp = use 0.682 to 0.855 SFR Imp = use 0.418 COM Imp = use 0.909 to 0.985 IND Imp = use 0.473 to 0.958 INST Imp = use 0.473 to 0.819
Runoff Coefficient	C = 0.9i + 0.05 Where *i* = Watershed imperviousness (range 0 to 1)
Drainage Area	A
Design Flow	Q = C x A x I
Swale Slope	0.01 <= S <= 0.06 where S is slope in ft/ft
Swale Shape	Trapezoidal
Manning's n	n = 0.25
Swale Bottom Width	W_b = 2ft to 8ft. Maximum limit on width is 10 ft
Swale Side Slope	Start with Z = 2H:1V flatten if space available
Swale Depth	Check that d = 3 to 4 in
Cross Sectional Area	$A_s = W_b + Zd^2$
Calculate Velocities	V = Q/A check that V <= 0.9ft/s if not decrease S or increase W_b.
Hydraulic Residence Time	Use t = 10 mins
Swale Bottom Length	L_b = 60 x t x V

Design Criteria	Recommendations
Freeboard	f >= 1ft
Swale Top Width	$W_t = W + 2(D + f)Z$
Swale Top Length	$L_t = L + 2(D + f)Z$
Surface area	$A_s = W_t \times L_t$
Area Ratio	$R = A_s/A$

The recommended velocity limitation of 0.9 ft/s combined with a maximum depth of 4 inches and bottom width of 10 feet results in a recommended maximum flow capacity of about 3 cfs. Limit the drainage area to each swale so as not to exceed the recommended maximum flow capacity. This can be accomplished by splitting roadside swales near high points in the road so that flows drain in opposite directions mimicking flow patterns on the road surface. Another way to limit drainage areas to long swales is to pipe flows in the swale off to the pipe system at regular intervals. For long swales, this limits the area that the swale is treating, thereby lowering flows and velocities in the calculations. Check dams can be incorporated into a vegetated swale design to promote enhanced settling and infiltration through velocity reduction and ponding. The Project will incorporate vegetated swales with check dams wherever velocities or slopes are too high for vegetated swales alone.

C.4.3. Preliminary Sizing Nomographs

The assumptions and criteria discussed in the previous sections were used to evaluate the relationship between basin size ratio and tributary area imperviousness for dry extended detention basins, vegetated swales, and bioretention areas. The results of this analysis are shown in Figure C-1 for detention basins and Figure C-2 for swales and bioretention[4]. The design assumptions made for each BMP type were as follows:

Detention:

Area: 20 acres

Imperviousness: 20% to 100%

Geometry: side slopes = 4H:1V, basin depth = 4 feet, length-to-width ratio = 2

Detention Time: 48 hours

Freeboard: 1 foot

Swales:

Area: 5 acres

Imperviousness: 20% to 100%

[4] Bioretention facilities are not a planned structural BMP for the Landmark Village Project, therefore design criteria is not provided in this document.

Geometry: Longitudinal slope = 4%, side slopes = 2H:1V
Roughness: 0.25
Residence time: 10 min
Freeboard: 1 foot

Bioretention:

Area: 5 acres
Imperviousness: 20% to 100%
Geometry: 4 foot depth of amended soils, ponding depth 0.5 feet
Infiltration Rate: 1.8 in/hr for amended soils, 0.2 in/hr for underlying native soils (bioretention without an under-drain)
Freeboard: N/A

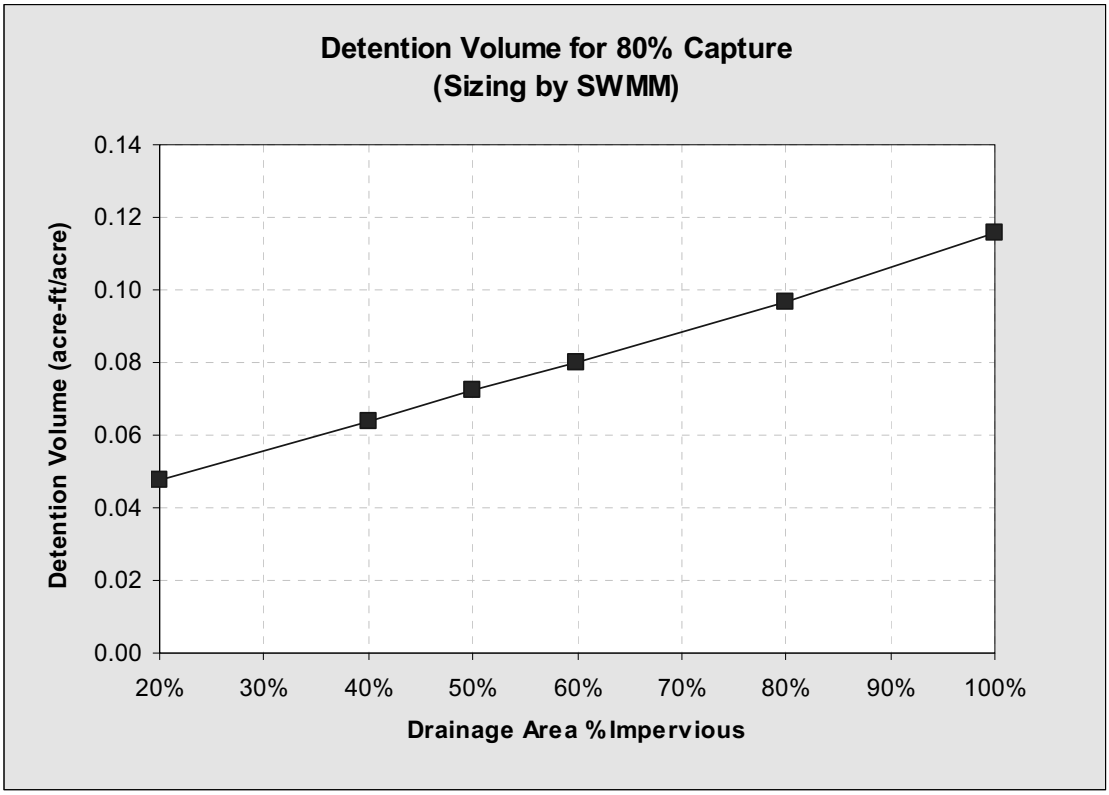

Figure C-1: Preliminary Sizing Nomograph for Dry Extended Detention Basin

1. SUSMP (0.75 in) - Sized to capture the volume of runoff produced from 0.75 inch storm event. Method based on LA SUSMP criteria 3 for volumetric treatment control BMP. Runoff coefficient determined using SUSMP Manual Appendix A.

2. SUSMP (1.125 in) - Sized to capture the volume of runoff produced from 1.125 inch (150% of 0.75 inch) storm event. Method adapted from LA SUSMP criteria 3 for volumetric treatment control BMP. Runoff coefficient determined using SUSMP Manual Appendix A.

3. SWMM - Sized to capture 80% of annual average runoff with an average drawdown time of 48 hours.

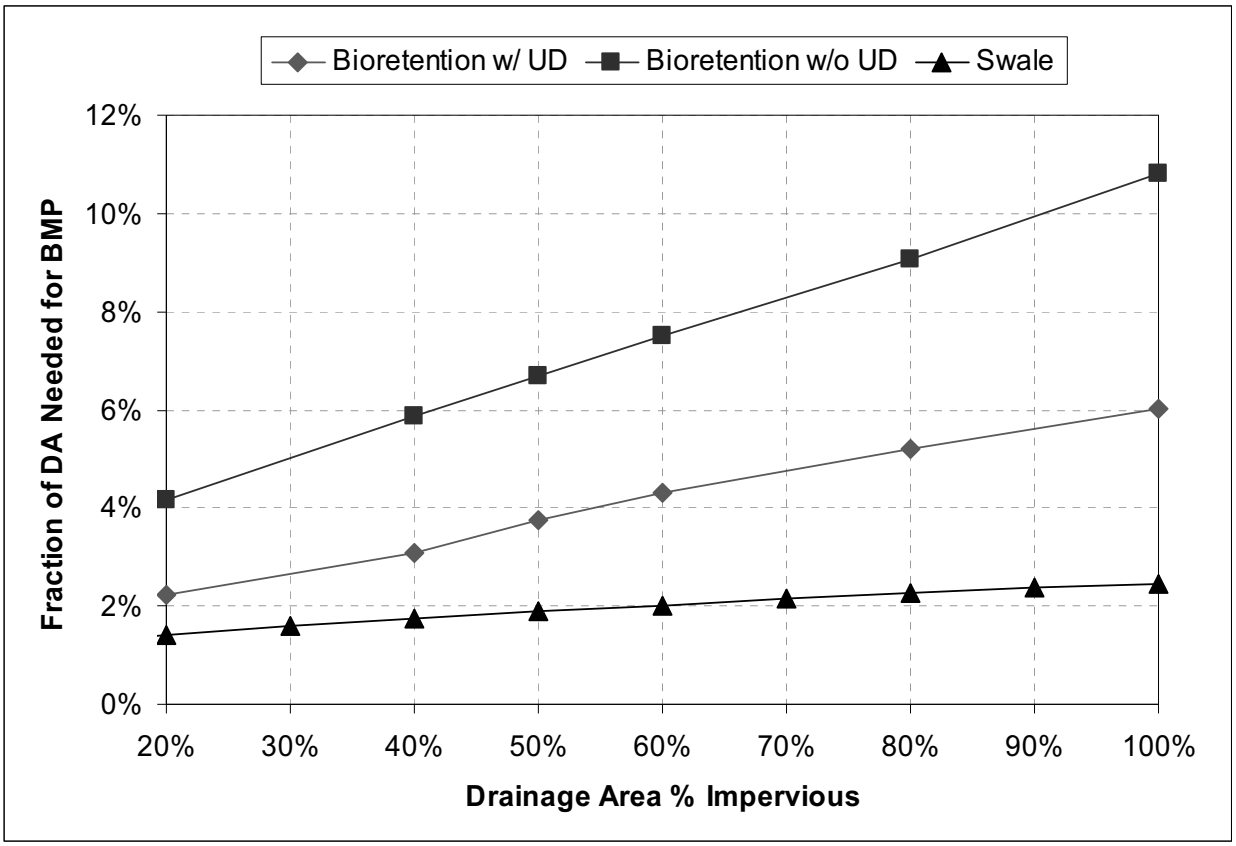

Figure C-2: Preliminary Sizing Nomograph for Swales and Bioretention Areas

C.5. References

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D. APPENDIX D: NEWHALL RANCH STORMWATER MONITORING DATA

March 6, 2000

Newhall Ranch Monitoring Station	Hardness mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Sodium mg/L	Alkalinity mg/L	Sulfate mg/L	Chloride mg/L	Nitrate mg/L	E.Coli MPN/100 mL	TDS mg/L
A-Mouth of Potrero	2360	324	378	30	1360	400	3690	780	16.1	8160	7530
B-Mouth of San Martinez	1070	229	122	8	392	210	1520	130	2.8	3090	2690
D-Mouth of Middle Canyon	44	11	4	6	9	30	16	3	12.4	133	160
E-Top of Chiquito Canyon	61	18	4	8	13	40	37	9	2.6	213	150

	Boron mg/L	Copper ug/L	Iron ug/L	Manganese ug/L	Zinc ug/L	Aluminum ug/L	Arsenic ug/L	Barium ug/L	Berylium ug/L	Cadmium ug/L	Chromium ug/L
A-Mouth of Potrero	2.6	20	4770	880	50	4570	5	155	0.6	0.4	7
B-Mouth of San Martinez	0.8	150	51500	4230	300	44000	21	391	7	8.8	47
D-Mouth of Middle Canyon		10	1290	350	30	2230		136	0.4	0.4	2
E-Top of Chiquito Canyon		40	11700	970	150	6280	3	210	1.4	1	10

	Lead ug/L	Mercury ug/L	Nickel ug/L	Selenium ug/L	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	TSS mg/L	VS mg/L	pH
A-Mouth of Potrero	8	0.01	22	12	50000	1600	1180	32800	8.2
B-Mouth of San Martinez	47.7	0.06	180	11	160000	1700	28000	40000	8
C-1/2 Mile Upstream of Onion Field					90000	11000			
D-Mouth of Middle Canyon	7.7	6			>160000	>160000	600	4100	7.5
E-Top of Chiquito Canyon	19.1		25		2400	2400	3490	9300	7.1

SS = suspended solids
VS = volatile solids

March 8, 2000

Newhall Ranch Monitoring Station	Hardness mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Sodium mg/L	Alkalinity mg/L	Sulfate mg/L	Chloride mg/L	Nitrate mg/L	E.Coli MPN/100 mL	TDS mg/L
A-Mouth of Potrero	2090	266	347	39	1470	360	3700	960	18.8	6470	7230
B-Mouth of San Martinez	1340	304	142	10	413	210	1900	120	3.1	2430	2960
C-1/2 Mile Upstream of Onion Field	147	44	9	3	10	80	87	3	1.6	323	190
D-Mouth of Middle Canyon	73	21	5	6	10	40	17	3	18.1	162	160
E-Top of Chiquito Canyon	153	43	11	11	18	70	119	12	2.9	420	260

	Boron mg/L	Copper ug/L	Iron ug/L	Manganese ug/L	Zinc ug/L	Aluminum ug/L	Arsenic ug/L	Barium ug/L	Berylium ug/L	Cadmium ug/L	Chromium ug/L
A-Mouth of Potrero	2.9	10	2460	510	30	1580	5	94.4	0.3	0.2	4
B-Mouth of San Martinez	0.8	200	47500	5210	360	69700	27	573	20	13.6	70
C-1/2 Mile Upstream of Onion Field		170	44600	6950	330	85100	13	2360	14	2	39
D-Mouth of Middle Canyon			1510	300	30	2300		132	0.5	0.4	2
E-Top of Chiquito Canyon		100	30700	2110	300	2360	6	470	4.4	2.7	27

	Lead ug/L	Mercury ug/L	Nickel ug/L	Selenium ug/L	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	TSS mg/L	VS mg/L	pH	TOC mg/L	Diazinon ug/L
A-Mouth of Potrero	4.2	0.03	15	12	30000	7000	490	850	8.2	21.2	ND
B-Mouth of San Martinez	59.2	0.24	330	11	>160000	205	54200	1840	7.8	11.6	ND
C-1/2 Mile Upstream of Onion Field	95.2	0.45	103	4	160000	1600	36000	1460	8.1	9.4	4
D-Mouth of Middle Canyon	7.6	0.02	6		50000	2400	10700	160	7.9	4	ND
E-Top of Chiquito Canyon	54.5	0.14	64	2	>160000	160000	9800	750	8	15.5	

SS = suspended solids
VS = volatile solids

E. APPENDIX E: LOS ANGELES UNIFIED SCHOOL DISTRICT INTEGRATED PEST MANAGEMENT PLAN

F. APPENDIX F: REVIEW OF BACTERIA DATA FROM SOUTHERN CALIFORNIA WATERSHEDS

G. APPENDIX G: EFFECT OF URBANIZATION ON GROUNDWATER RECHARGE IN THE SANTA CLARITA VALLEY

Impact Sciences, Results of Focused Surveys for Unarmored Threespine Stickleback and Other Special-Status Fish Species

Results of Focused Surveys for Unarmored Threespine Stickleback and Other Special-Status Fish Species; Natural River Management Plan Area Valencia, California

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June 2003

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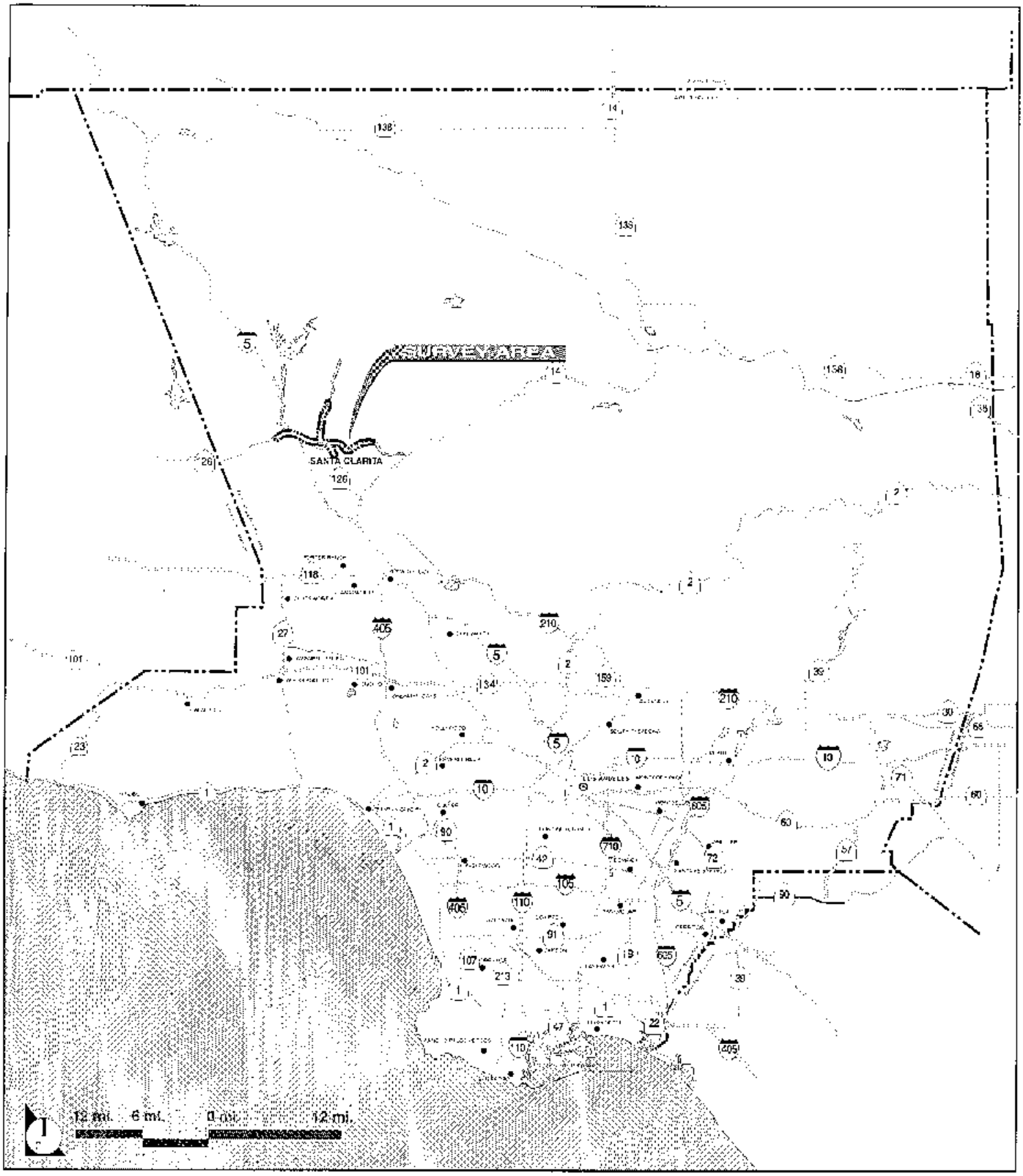
Results of Focused Surveys for Unarmored Threespine Stickleback and Special-Status Fish Species
Newhall Ranch
Valencia, California

The following presents the findings of focused protocol surveys that were conducted from March through June, 2002 to determine the presence/absence of the federally- and state-listed Endangered unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*) (herein UTS) in portions of the Santa Clara River in Los Angeles County that are incorporated within and upstream of the Natural River Management Plan area. This report is intended to provide project specific biological information to Newhall Ranch Company, US Army Corps of Engineers (ACOE), US Fish and Wildlife Service (USFWS), and California Department of Fish and Game (DFG) regarding results of focused surveys for unarmored threespine stickleback and additional special-status fish species including arroyo chub (*Gila orcutti*) and Santa Ana sucker (*Catastomus santaanae*) identified within the subject survey reaches.

INTRODUCTION

The survey area is located in northwestern Los Angeles County (**Figure 1**), within the Newhall, California US Geological Survey (USGS) 7.5-Minute Quadrangle Map, All sample sites selected were within potentially suitable habitats in portions of the Santa Clara River from near its confluence with Castaic Creek, east (upstream) approximately 7.2 miles. The survey effort also included approximately 2.5 miles of tributary drainages including San Francisquito Creek from its confluence with the Santa Clara River, north to the Copper Hill Bridge; the South Fork Santa Clara River from its confluence with the Santa Clara River, southeast to the Saugus Ventura Road Bridge crossing; and Bouquet Canyon Creek from its confluence with the Santa Clara River, northeast to the Newhall Road Bridge crossing. The primary purpose of these surveys was to determine current distribution of the UTS and to differentiate specific habitat characteristics being utilized by UTS within the portions of the Santa Clara River watershed included in the Natural River Management Plan area, as well as additional drainage areas on land owned by The Newhall Land and Farming Company. The secondary purpose was to determine the presence and current distribution of other special-status fish species including the Santa Ana sucker and the Arroyo chub.



NEWHALL RANCH
SPECIFIC PLAN

Figure 1
REGIONAL LOCATION

JUNE 2003

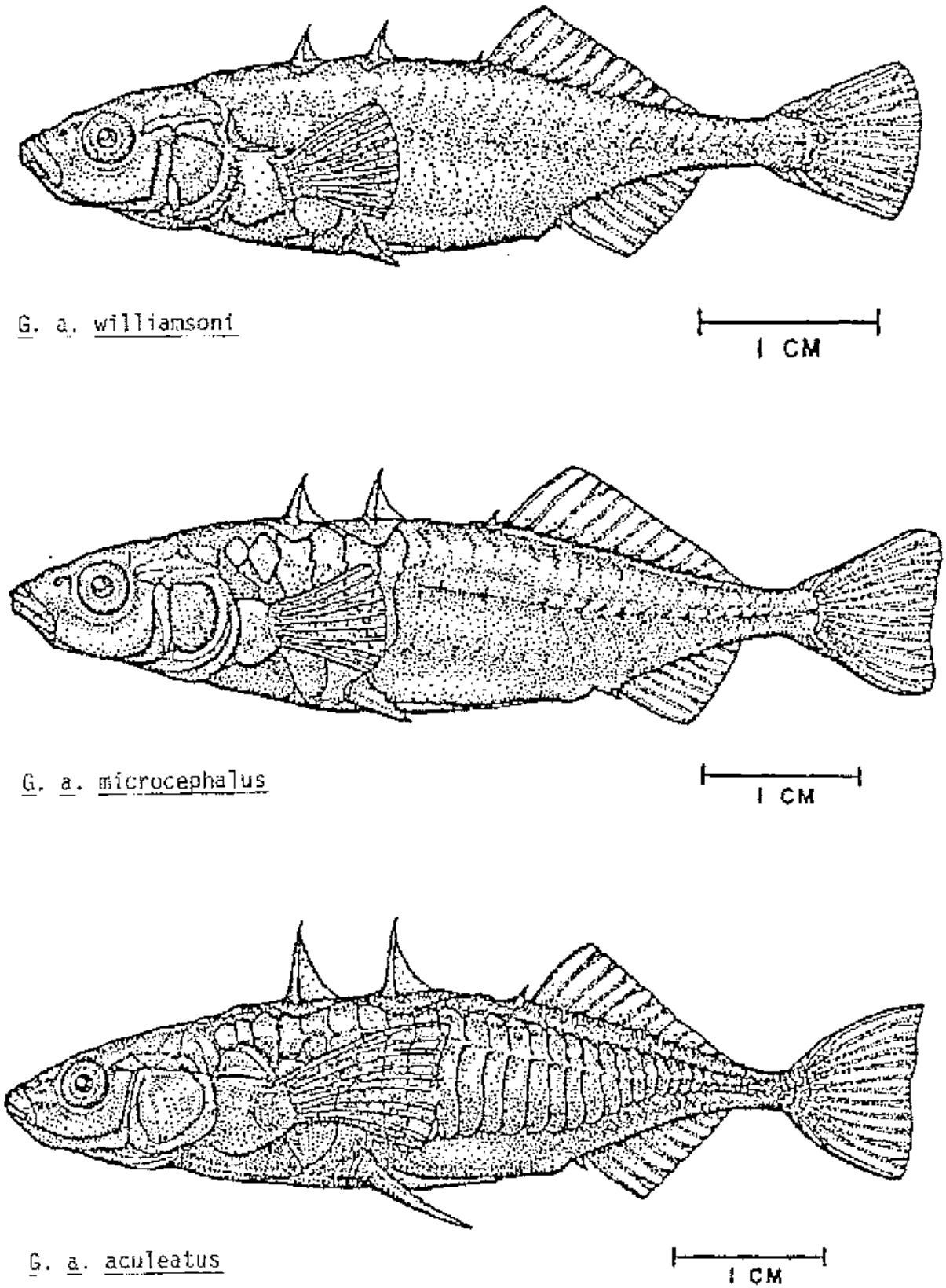
General UTS Background

Sticklebacks are a small (rarely exceeding 2.4 inches) streamline fish with two isolated dorsal spines, with a third, smaller spine at the front edge of the soft-rayed portion of the dorsal fin (USFWS 1985). Additional distinctive features include the unusual pelvic girdle that includes a spine on both sides, and the bright nuptial coloration of the male. The male stickleback builds a nest of fine plant debris and algal strands where it courts females that enter its territory. Several females may deposit eggs in a single nest. The males care for and protect the eggs and young. Sticklebacks are apparently an annual species, surviving for only one year (USFWS 1985), though some local scientists believe some individuals may live more than one year.

Three morphologically distinct subspecies of threespine stickleback (*Gasterosteus aculatus*) occur in California. Two of these, the semi-armored (*G. a. microcephalus*) and the subject unarmored subspecies (*G. a. williamsoni*) occur in the Santa Clara River system. The number of, or absence of, bony lateral plates is the primary characteristic in differentiating the subspecies. The fully armored subspecies (*G. a. aculeatus*) typically has a row of bony plates that extends the full length of both sides of its lateral surface from above the gill plate to the base of the caudal fin. Lateral plates on the semi-armored subspecies do not extend the full length and are limited to the anterior portion of the body. **Figure 2** provides an illustration of the three subspecific morphological characteristics.

Regional distribution of UTS is thought to have originally included the headwaters of the Santa Clara River, and low gradient portions of the Santa Ana, San Gabriel, and Los Angeles Rivers (USFWS 1985). The latter three populations are now extinct and it is now generally accepted that distribution of the remaining naturally occurring UTS population is limited to the Santa Clara River, east (upstream) and including the juncture with San Martinez Grande Canyon. The USFWS 1985 Revised Recovery Plan also includes a population in the San Antonio Creek drainage in Santa Barbara County and was considering a population in Shay Creek, San Bernardino County. All of these populations are protected by the federal listing. However, more recent genetic data suggest these and another population later discovered in the Baldwin Lake basin are not UTS (Haglund 1988).

The UTS was listed as an Endangered species by the USFWS in October 1970 (35 Federal Register 16047) and by the State of California in June 1971. A federal Recovery Plan was initially prepared by USFWS in 1977 and a Revised Recovery Plan was prepared in December 1985. Critical habitat was proposed in 1980. However, in September 2002, the USFWS determined that the proposed designation of critical habitat should not be made (67 Federal Register 58580).



Source Hagland, 1989

NEWHALL RANCH
SPECIFIC PLAN

Figure 2
SUBSPECIFIC MORPHOLOGICAL CHARACTERISTICS

JUNE 2003

Overview of UTS Habitat Characteristics

Breeding, and newly hatched young occur in clean water, along shallow stream edges or braids in dense vegetation, where they are protected from being washed away in the stream current. In these areas the water temperatures are typically warmer, which is thought to increase the speed of development of the young. Larger juveniles and sub-adults (less than 0.8 inches) are also usually observed in the protection of dense vegetation, in slow moving or standing water (USFWS 1985).

Adults have been found in a variety of habitats throughout the stream, but tend to occur most frequently in areas of slow or standing water. When occurring in the main stream channel, they tend to seek shelter behind obstructions and under vegetation (USFWS 1985).

Essential Habitat Designation

Essential habitat is not specifically defined in the Recovery Plan for the species. However, it is stated that the designated Essential Habitat coincides with the areas proposed by the USFWS as Critical Habitat (45 Federal Register 76012-76015). In this proposal Critical Habitat is defined as: (1) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Endangered Species Act of 1973 as amended, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures that are necessary to bring an endangered or a threatened species to the point at which listing under the Act is no longer necessary (USFWS, 2001).

Critical Habitat was initially proposed for UTS in 1980. However, as a result of a lawsuit by the Center for Biological Diversity in January 2002, USFWS was forced to evaluate whether or not to designate Critical Habitat for the UTS and reached a finding that the designation should not be made (67 Federal Register 58580). In 1985, the USFWS prepared a Revised Recovery Plan identifying three Essential Habitat zones within the Santa Clara River watershed (**Figure 3**). They are described in the Revised Recovery Plan (USFWS 1985) as follows:

1. Del Valle Zone. An area of land and water with the following components (San Bernardino meridian): Santa Clara River within T4N, R16W and R17W, beginning at its confluence with San Martinez Grande Canyon, at a point 0.9 of a mile (1.5

kilometers) southwest of Del Valle settlement, and extending upstream approximately 5.6 miles (8.8 kilometers) to the Interstate Highway 5 Bridge.

2. San Francisquito Creek Zone. An area of land and water with the following components (San Bernardino meridian): San Francisquito Canyon watercourse, within T5N, R16W and T6N, R15W, beginning at a point where the Angeles National Forest boundary intersects the San Francisquito Canyon watercourse approximately 2.5 miles southwest of San Francisquito Powerhouse No. 2, and extending upstream in San Francisquito Canyon approximately 8.4 miles (13.5 kilometers) to San Francisquito Powerhouse No. 1, near its junction with Clearwater Canyon.

3. Soledad Canyon Zone. An area of land and water in Los Angeles County, with the following components (San Bernardino meridian): Santa Clara River within T4N, R13W, and R14W, beginning at a point 1.4 miles (2.3 kilometers) upstream in Soledad Canyon from the community of Lang, at the downstream end of the area called River's End Park, at 34° 26′ 7″ N, 118° 21′ 51″ W, thence extending upstream approximately 8.5 miles (13.7 kilometers) to its confluence with Arrastre Canyon, at a point located about 0.6 of a mile (1 kilometer) southwest of Los Angeles County Rehabilitation Camp, thence upstream in Arrastre Canyon approximately 0.8 of a mile (1.4 kilometers) to 34° 26′ 7″ N, 118° 11′ 51″ W.

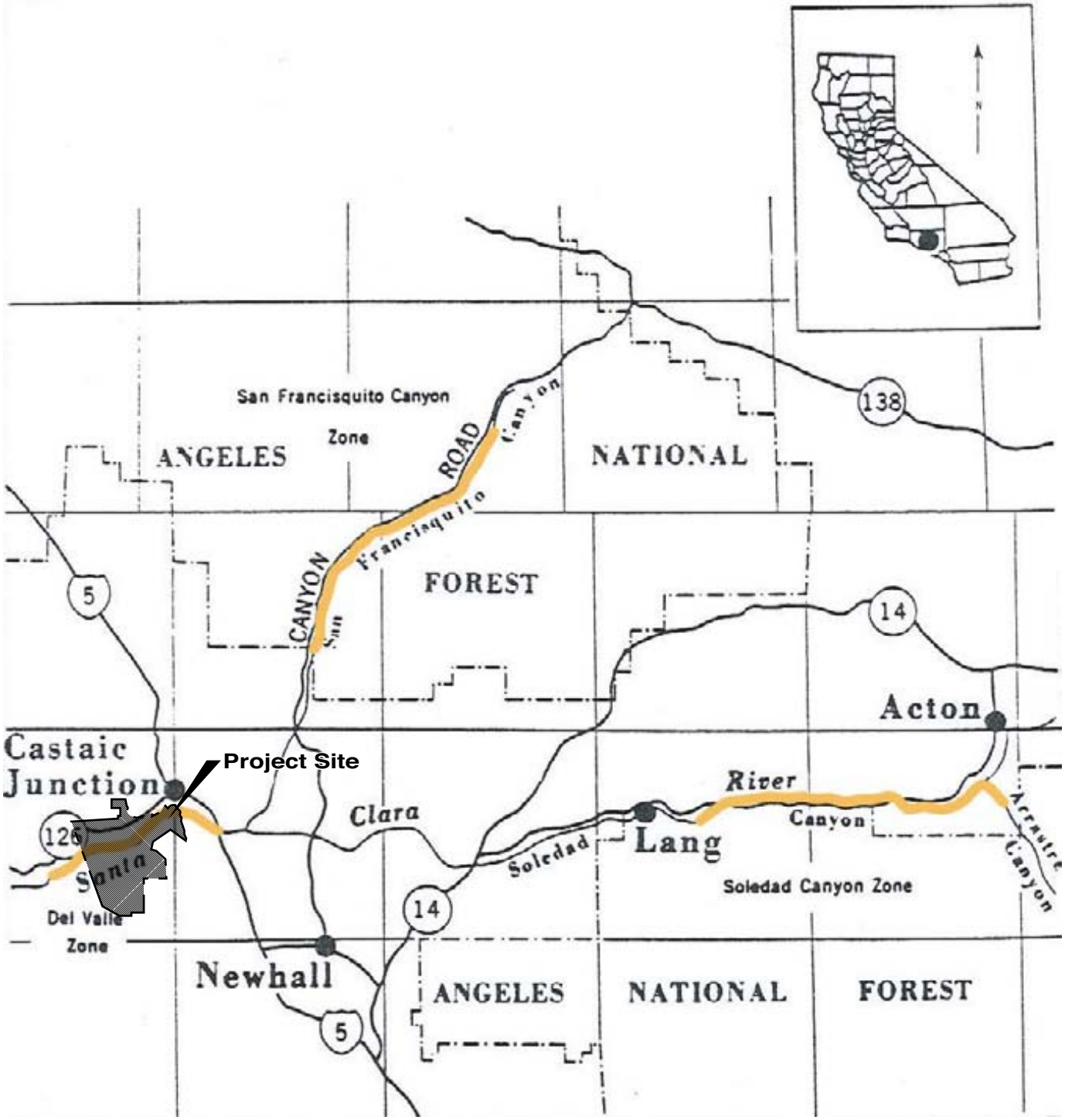
Criteria used by USFWS to select Critical Habitat, and thus Essential Habitat, include evaluation of an area to determine the presence of primary constituent elements. These elements include physical and biological features that are essential to the conservation of the species, and that may require special management and protection (USFWS 1980). Primary constituent elements for UTS include specific quantity and quality of water and isolation from predators. These elements are specifically outlined in the Proposed Rule (USFWS 1980) and include:

- Permanent Stream Flow. Remaining streams utilized by this fish have low discharge rates, so that relatively minor modifications of ground water levels or channel characteristics could result in elimination of all fishes by desiccation.

- Slow Current. Sticklebacks favor shallow water with slow to moderate current, and probably can not reproduce effectively in deep, swift or completely still water.

- Low Turbidity and Pollution. Sticklebacks strongly favor clear water, seldom or never being found in turbid water conditions. Specific pollution susceptibilities have not yet been established, but water quality has been found to be high where populations have persisted, and they have disappeared from streams with reduced water quality.

- Isolation. Survival and genetic integrity evidently depend on the absence of large aquatic predators, certain potential competitors, and all other subspecies of sticklebacks. The latter are not particularly strong swimmers, and apparently do not move upstream during times of high water. They are excluded from the designated areas at other times by natural barriers in certain segments of the watercourse. These barriers should not be modified or bypassed.



ESSENTIAL HABITAT

Source UTS Recovery Plan, 1985

NEWHALL RANCH™
SPECIFIC PLAN

Prepared For: Newhall Ranch Company

Figure 3
ESSENTIAL HABITAT ZONES

JUNE 2003

It should be noted that, as with most fish species, UTS are not distributed uniformly throughout the Santa Clara River, and that breeding habitats are patchily distributed. The nature of breeding habitats is dynamic and may shift in structure and specific location from year to year depending upon seasonal rainfall and storm cycles. However, most of the breeding habitats identified over the past several years of study have been concentrated in the same general areas and support the same general habitat conditions.

It is expected that the perennial source of tertiary treated effluent discharged from Water Reclamation Plants (WRP) 32 and 26 contribute to provide more persistent breeding and nursery habitats than occurred naturally in areas located downstream from these locations. The discharge is relatively consistent in temperature and average velocity. Larger storm events are still expected to significantly alter breeding and nursery areas in the short term, but the regular release of water from the WRPs likely allows for extended breeding throughout the otherwise dry summer months.

General Santa Ana Sucker Background

Santa Ana suckers are endemic to drainages of the Los Angeles Basin including the Los Angeles, San Gabriel, and Santa Ana Rivers. This is the smallest sucker species in California, rarely reaching lengths greater than six inches (McGinnis 1984). They primarily feed on algae, detritus, and diatoms and have indicated intolerance for polluted or highly modified streams. Spawning generally occurs from April through early July and peaks in late May to early June. From 4,400 to over 16,000 eggs may be laid by a single female over gravel substrate. Santa Ana suckers are relatively short-lived, rarely surviving beyond their second year (Haglund and Baskin 1995). Like the UTS, Santa Ana suckers have evolved in drainages that often dry to small scattered pools in the dry summers; tolerant of warm water and low oxygen levels.

This species occurs in a variety of habitats within small to medium-sized (less than 22 feet wide) perennial stream channels with gravelly to rocky substrates. They are found in depths ranging from a few inches to over three feet and occur in variable flows from slow to swift (Moyle et al. 1995). Santa Ana suckers are typically found in clear water, but can tolerate periods of increased turbidity.

The Santa Ana sucker was listed by the USFWS as a threatened species on May 12, 2000. However, as this species is considered to be introduced in the Santa Clara River watershed, the population here is specifically excluded from the federal threatened status. Santa Ana suckers are considered by CDFG to be Species of Special Concern. CDFG does not differentiate Santa Ana Suckers occurring in the Santa

Clara River from other populations. This species was considered to be abundant as recently as 1970, but has since significantly declined in most of its native drainages (Moyle et al. 1995).

General Arroyo Chub Background

According to Moyle (1995) arroyo chubs are native to the Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita rivers, as well as, Malibu and San Juan Creeks. They have also been introduced into a number of drainages, extending their current range north to Chorro Creek in San Luis Obispo County. The population in the Santa Clara River, including the study reach, is also considered an introduced population.

The arroyo chub is relatively small, with adults averaging five inches in length. They are known to spawn primarily during March and April, though some may breed into July (Haglund and Baskin 1995). Spawning typically occurs in slow pools with aquatic vegetation. Some arroyo chubs have been determined to be over 4 years old, but breeding begins after the first year. After the second year, females are generally larger than males (Haglund and Baskin 1995). An omnivorous species, the arroyo chub feeds on algae, insects, and small crustaceans. They are believed to obtain much of their nutrition from the organisms associated with the aquatic plants (Haglund and Baskin 1995). Like the other two fish species discussed, the arroyo chub has evolved to tolerate high temperatures and hypoxic conditions that occur in the dry summers.

Habitat requirements are described by Moyle (1995) as slow-moving or backwater sections of warm to cool streams with mud or sand substrates. Within the survey reach, chubs were the most abundant species present and were detected in a variety of microhabitat conditions and flows, including open swift flowing portions of the channel.

The arroyo chub is not listed by either federal or state regulatory agencies, but is considered a Species of Special Concern by CDFG due to its declining status in its native drainages. The special concern status does not distinguish between native and introduced populations.

METHODOLOGY

Previous Studies In and Near the Newhall Ranch Project Area

Documentation pertinent to the biological resources in the vicinity of the site was reviewed and analyzed. Information reviewed included: (1) the Revised Recovery Plan for the unarmored threespine

stickleback; (2) literature pertaining to habitat requirements of sensitive species potentially occurring on the project site; (3) the California Natural Diversity Data Base (CNDDB 2002) information regarding special-status species potentially occurring on the project site for the Newhall and Val Verde USGS 7.5-Minute Quadrangle Maps, and (4) previous surveys for aquatic resources in the Newhall Ranch Specific Plan area and vicinity.

The following are sources that provide information regarding special-status fish distribution within and/or in the near vicinity of the study reach. Each of these sources has identified UTS, Santa Ana sucker and arroyo chub as occurring in and near portions of the respective study areas. The general consensus of distribution for UTS in the Santa Clara River includes all areas supporting surface water east (upstream) of the Ventura/Los Angeles County line near San Martinez Grande Canyon.

- U.S. Fish and Wildlife Service. Recovery Plan (revised); Unarmored Threespine Stickleback. Revision approved December 26, 1985. The first description of the unarmored subspecies was by Girard in 1854 from a specimen collected in Soledad Canyon. Distribution of UTS in the Santa Clara River is described as "…the headwaters of the Santa Clara River and its tributaries, in northern Los Angeles County.

- Aquatic Consulting Services, Inc.; July 2002. Aquatic Surveys Along the Santa Clara River; Part IV: Ventura County Line to Las Brisas Bridge, Ventura County, California – Protocol surveys for special status fish species during 2001. Three of 49 sampling locations identified stickleback as being present. All three were within 1.3 miles of the County boundary. None of the sample data indicated the total number of individuals collected and two of the three sample sites indicated sticklebacks were represented as fry or juveniles.

- Aquatic Consulting Services, Inc.; June 2002. Aquatic Surveys Along the Santa Clara River: Part III: West of Commerce Center Bridge to the Ventura County Line, California – Protocol surveys for special status fish species during 2001. Seven of the 56 locations sampled included UTS. None of the sample data indicated the total number of individuals collected and some of the sample sites indicated sticklebacks were represented as juveniles.

- Thomas Haglund and Jonathan Baskin, 2000. Fish and Wildlife Survey and Habitat Assessment of the Santa Clara River at Interstate 5 – This project was conducted for the California Department of Transportation for replacement of the Interstate 5 Bridge where it crosses the Santa Clara River. This study included focused special-status fish surveys. Several sites were sampled within 500 meters upstream and downstream of the bridge using a 1/8 inch mesh seine. Arroyo chub, UTS and Santa Ana sucker were detected throughout the survey reach. Large numbers of fry of all threes species were detected and suggest breeding by all three species was occurring in that vicinity in 2000. Identification of UTS was made by morphological characteristics, primarily plate counts.

- Thomas Haglund and Jonathan Baskin; December 1995. Final Report; Sensitive Aquatic Species Survey, Santa Clara River and San Francisquito Creek, Newhall Land and Farming Company Property, Los Angeles County, California – Survey results indicated UTS were "continuously distributed from Bouquet Canyon Road Bridge downstream to the confluence of Castaic Creek". Positive subspecific identification was made through horizontal starch gel electrophoresis.

- Thomas Haglund, 1989. Current Status of the Unarmored Threespine Stickleback (Gasterosteus aculeatus williamsoni) along portions of the Santa Clara River Drainage – The project reach for

this report included the Santa Clara River from near the confluence with Castaic Creek upstream to near Saugus; Castaic Creek from Interstate 5, downstream to SR 126; and the downstream portion of San Francisquito Creek outside the National Forest. Identification methodology included characterization of lateral plate counts and then identification was further verified utilizing electrophoretic methods. The report concluded that stickleback were absent from lower San Francisquito Creek and were rare in Castaic Creek. Distribution of sticklebacks was patchy along the study reach within the Santa Clara River. The report further determined that the sticklebacks sampled throughout the reach were the unarmored *G. a. williamsoni*.

- Impact Sciences, Inc. 2003. Results of Focused Surveys For Unarmored Threespine Stickleback and Other Special-Status Fish Species; Newhall Ranch, Valencia, California – This report covered survey results conducted in the Santa Clara River from the Las Brisas Bridge crossing in Ventura County, east (upstream) to the Castaic Creek Confluence. Identification of UTS was accomplished by lateral plate counts. Results of the survey indicated scattered, but regular distribution of UTS east of San Martinez Grande crossing. A few individuals appearing to be UTS, based solely on lateral plate counts, occurred downstream of San Martinez Grande crossing.

Survey Scope and Methods

Though there are no specific survey protocol for sampling UTS, USFWS developed particular criteria to determine sub-specific identification when surveying for sticklebacks. The criteria state "*G. a. williamsoni* are readily distinguished from the other two subspecies on the basis of lateral plate counts alone, provided that at least 25 morphologically mature specimens (i.e., individuals of at least 32mm in standard length [SL], Bell [1981]) are available. Samples of *G. a. williamsoni* generally average 0.06 to 0.55 lateral plates per individual and *G. a. microcephalus* average more than six lateral plates per individual (Bell 1976b)." Plate counts referred to include total number occurring on both sides of the body.

As previously discussed, it is generally accepted by USFWS and UTS experts that sticklebacks occurring east (upstream) of San Martinez Grande Canyon, near the Los Angeles/Ventura County boundary, are the endangered unarmored subspecies. Impact Sciences performed focused surveys for UTS between March 27 and June 15, 2002. Surveys were conducted by Mr. Dave Crawford under the authority of his individual USFWS Section 10(a)(1)(A) Endangered Species Recovery permits.

The purpose of the survey effort was to determine presence/absence, and if present the current distribution of UTS and other special-status fish species within the Natural River Management Plan area. In order to minimize impacts to the species, whenever UTS were detected, an effort was made to collect no more than 25 individuals for subspecific identification purposes. If 25 individual UTS were collected, no further sampling was to be conducted at that survey location. All fish collected during the survey effort were released immediately following identification. No UTS or other special-status fish species were lost during the survey effort.

Sampling was conducted utilizing a 15x5-foot 1/8-inch mesh seine and a small hand net. Most locations observed within the survey reach that supported typically suitable habitat were sampled. However, additional survey sites were also sampled such that representative locations of all habitat types present in the survey reach were included. A total of 48 survey locations were sampled within the survey reach covered in this study (**Figure 4**). At each sample site, the location was recorded utilizing a GPS unit (with sub-meter accuracy), the stream was sampled for fish and general habitat characteristics were recorded. All fish were identified, as were any other special-status aquatic wildlife species observed. In addition to fish sampling, the survey effort included an analysis of habitat types being utilized by UTS.

SURVEY RESULTS

During some of the survey efforts, there was a higher than average volume of water flowing at a relatively high velocity compared to typical summer season flows. The focus species of this survey, particularly sticklebacks, tend to avoid areas of high velocity flows. Additionally, areas of high flow rates combined with a high volume of water affects the efficiency of the seining efforts with small mesh nets as the weighted line is often lifted from the bottom of the stream, permitting escape of trapped fish. As such, the higher flow rates may have some affect on the data, and therefore, on the perceived distribution of special-status fish species occurring in the survey area.

Several portions of the survey reach were dry at the time of the surveys. These areas are also illustrated in **Figure 4**. Each of these areas was walked to determine if there were isolated pools potentially supporting fish. There were no such pools discovered in any of the indicated dry stretches of streambed.

Unarmored threespine stickleback and Arroyo chub were recorded in multiple locations within remaining flowing channels of the survey area. One sample site recorded the presence of Santa Ana sucker.

Out of the total 48 sample locations, 21 locations recorded the presence of one or more UTS. Both adults and subadults were recorded in most of the locations where the species was detected. Numerous individuals, including early stage juveniles, were recorded in two general areas including the marshy area north of the main channel at Castaic Junction and the confluence of San Francisquito Creek. Their presence combined with the occurrence of relatively ideal habitat conditions at those areas suggest these may be important breeding and/or nursery areas.

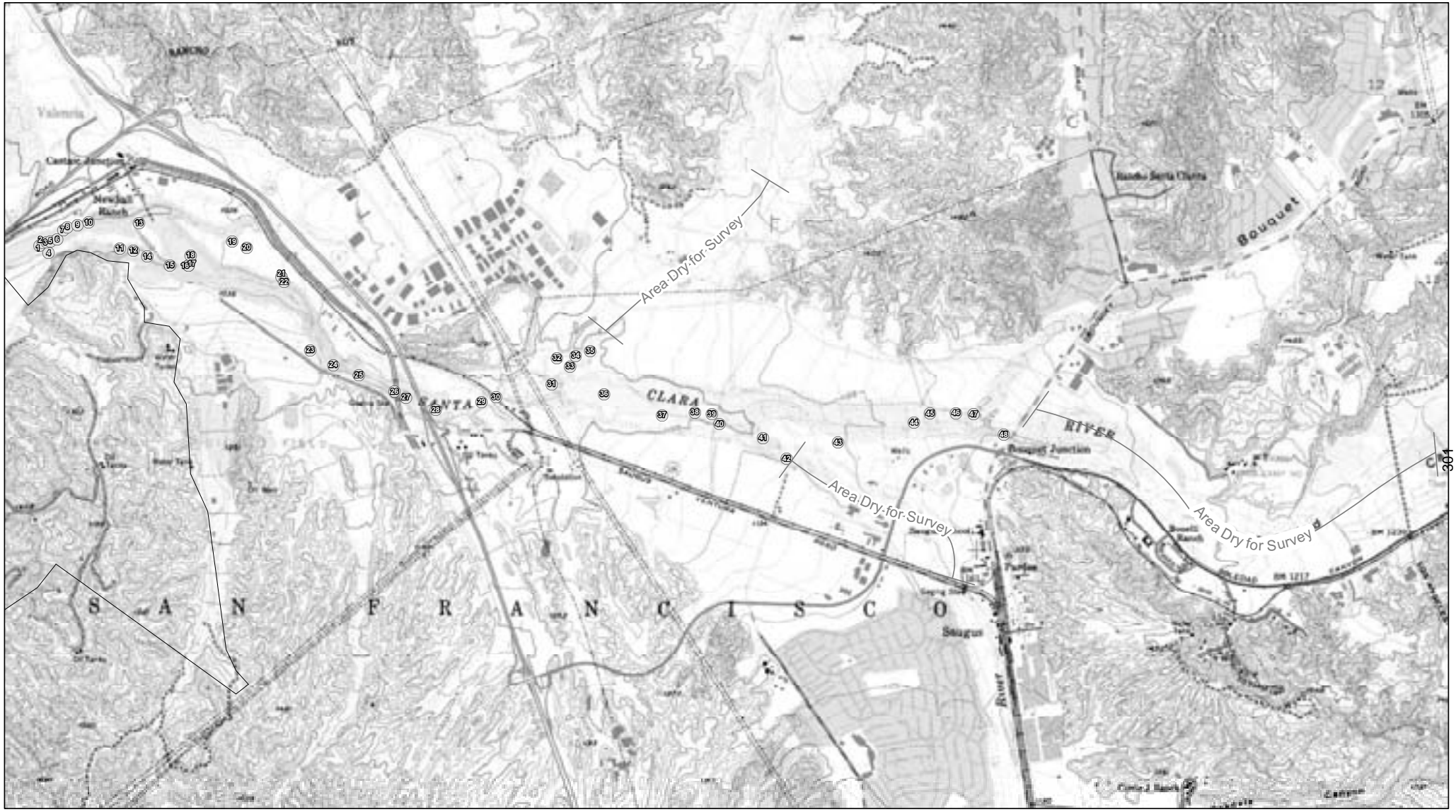


FIGURE 4

SURVEY REACH

0 1,550 3,100 Feet

All sticklebacks captured and recorded had one or less lateral plates. Several of the locations yielded 25 or more individuals, confirming the conclusion that these were the endangered unarmored subspecies *G. williamsoni*. The plate counts from this and previous studies in this area, and electrophoresis data previously recorded from these areas, suggest all of the UTS recorded in this survey reach were also of the endangered subspecies.

Santa Ana suckers were identified at only one location. Two single adults were observed at sample station 24. This species has been identified in the survey reach covered by this study previously. As two individuals were identified, and the survey methodology for this study only included a single sampling at any one given point, it is reasonable to assume that Santa Ana suckers still periodically occur throughout the study reach.

Arroyo chub were abundant throughout the reach. They were observed at nearly half of the sample locations, and they occurred in large numbers at most of those locations. All age classes were recorded suggesting that spawning likely occurs throughout both of the survey reaches.

Additional fish species recorded in this survey include prickly sculpin (*Cottus asper*), mosquitofish (*Gambusia affinis*), sailfin molly (*Poecilia latipinna*), goldfish (*Carassius auratus*), and largemouth bass (*Micropterus salmoides*). The latter three species were all recorded at station 48, in the pool created by runoff outfall. None of these species are considered native to the Santa Clara River watershed. Largemouth bass is a predatory fish that may significantly affect native fish populations where it occurs.

Appendix A provides a summary of data collected for each sample site including the recorded GPS coordinates, a brief description of the habitat(s), the species of fish collected, and any other pertinent and incidental recorded observances.

Habitat Evaluation Summary

Nearly all of the Santa Clara River within the Natural River Management Plan area, east (upstream) of the Castaic Creek confluence is considered by regulatory agencies and fisheries biologists to be of relatively high quality for UTS as this species has been identified throughout this reach and because most or all of the primary constituent elements for UTS habitat are present. Results of the surveys reported herein confirm the presence of UTS in scattered locations throughout the survey reach and generally support previous data.

As discussed the habitat evaluation was conducted concurrently with the presence/absence surveys within the survey reach with the goal of identifying specific important breeding and nursery areas, and any other habitats where UTS appeared to occur in concentrated numbers. The data suggest there were two areas within the Natural River Management Plan survey reach that may be of particular importance as breeding and/or nursery areas. These include the marshy areas north of the primary channel at Castaic Junction and the San Francisquito Creek confluence area.

In both areas, habitat conditions are relatively similar in that each support very dense riparian woodlands providing relatively constant shade over shallow, slow moving, marshy areas. In the majority of locations where juvenile UTS were located, there were submergent filamentous algae, emergent vegetation, or both. Juveniles were rarely found where the combined submergent and emergent vegetation covered more than 50 percent of a channel or pool.

CONCLUSION/DISCUSSION

Special status fish species including UTS, Santa Ana sucker, and arroyo chub were identified within several areas of the survey reach that supported surface water. The data further indicate that there are currently two areas of important breeding and grow-out habitat for UTS. Additionally, the presence of several arroyo chubs suggest that habitats and conditions within the surveyed areas continue to be of suitable quality to support reproducing populations of this special-status species. Although only two Santa Ana suckers were identified during the survey effort, it is expected that they still periodically occur as well.

Although the populations of Santa Ana sucker and arroyo chub in the Santa Clara River watershed are considered to be introduced, their presence and persistence here is important as many of the drainages to which they are native, continue to be impacted by urbanization. As such, the Santa Clara River populations may one day serve as an important genetic base for the continued survival of these species if remaining native populations continue to decline elsewhere.

The presence of Santa Ana sucker and arroyo chub does not appear to negatively affect the persistence of UTS where they occur together. Because all three have similar habitat requirements, the management and protection of UTS will likely benefit Santa Ana sucker and arroyo chub.

Management and protection of UTS should continue and should include measures to preserve and protect all of the primary constituent elements. Permanent stream flow is facilitated in the subject survey area by releases of tertiary treated water from the WRP No. 32 near Castaic Junction and WRP No. 26

further upstream (adjacent to Bouquet Canyon Road Bridge). Past and recent survey data suggest that this perennial effect may facilitate year-round breeding and a greater amount of dispersal habitat for young downstream of these releases. As the releases are intermittent, some areas of slow current are maintained, turbidity is minimized and the treatment process of the water appears to satisfactorily limit pollution. Additional measures to limit the influx of pollutants into the river should continue to be part of the design and environmental review process for future development projects along the river. Further, it will be important to ensure existing natural barriers of genetic transfer are maintained such that the semi-armored subspecies of stickleback is not permitted to breed with the unarmored population.

Of particular importance is the protection of the two identified breeding/nursery areas. It will be important to consider these areas when designing any future bank stabilizations or channel improvements. Specifically, it will be important to maintain shallow, slow-moving marshy areas and the associated riparian woodland vegetation. Buried bank stabilization has already been completed on the northwest side of the San Francisquito Creek confluence. The existence and persistence of the adjacent high-quality breeding and nursery habitat suggest that this form of stream bank stabilization, combined with conservation of existing riparian woodlands, would be the preferred method for future projects in the river and its tributaries.

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APPENDIX A

Natural River Management Plan Area Fish Survey Data

Appendix A

Natural River Management Plan Area Fish Survey Data

Station # 1	GPS location: 34º 26' 07"N 118º 36' 45"W
Habitat Description:	[Main channel] Stream width ±5', Depth ±24" Sandy cobble substrate Outer dense willows; Stream edge dense cattails, mule fat No submergent algae
Species Recorded:	arroyo chub
Station # 2	GPS location: 34º 26' 08"N 118º 36' 44"W
Habitat Description:	[Marshy area at base of south bank] Stream width ±2', Depth ±1", Silty sand substrate Edge of dense cottonwood/willow woodland; mule fat, cocklebur No submergent algae
Species Recorded:	None
Station # 3	GPS location: 34º 26' 08"N 118º 36' 43"W
Habitat Description:	[Narrow braid] Stream width ±4', Depth ±2", sandy substrate Dense willow and cottonwood; No submergent algae
Species Recorded:	None
Station # 4	GPS location: 34º 26' 06"N 118º 36' 42"W
Habitat Description:	[Narrow braid at base of south bank] Stream width ±2', Depth ±4", Silty sand substrate Outer dense willow/cottonwood/arundo; Stream edge grass, water speedwell, cattail, watercress <5% submergent algae
Species Recorded:	14 UTS (all age classes)
Station # 5	GPS location: 34º 26' 08"N 118º 36' 42"W
Habitat Description:	[Narrow braid at base of north bank] Stream width ±3', Depth ±4", Sandy substrate Dense giant reed/willow/cottonwood/grass <10% submergent filamentous algae
Species Recorded:	1 UTS (1 subadult)
Station # 6	GPS location: 34º 26' 09"N 118º 36' 35"W
Habitat Description:	[Narrow braid at base of north bank] Stream width ±4', Depth ±3", Sandy substrate Dense giant reed/willow/cottonwood/grass <10% submergent filamentous algae
Species Recorded:	10 UTS (7 subadults, 3 adults), arroyo chub, mosquitofish

Natural River Management Plan Area Fish Survey Data

Station # 7	GPS location: 34º 26' 08"N 118º 36' 39"W
Habitat Description:	[Marshy area at base of north bank, south of ag field] Stream width ±6', Depth ±4", silty substrate Dense willows/arundo/mule fat - shaded No submergent filamentous algae
Species Recorded:	Four (4) UTS (1 adult m, 3 subadult)
Station # 8	GPS location: 34º 26' 11"N 118º 36' 37"W
Habitat Description:	[Marshy area at base of north bank, south of ag field] Stream width ±6', Depth ±4", silty substrate Dense willows/giant reed/mule fat - shaded No submergent filamentous algae
Species Recorded:	Four (4) UTS (1 adult m, 3 subadult)
Station # 9	GPS location: 34º 26' 12"N 118º 36' 35"W
Habitat Description:	[Small braided channel at base of north bank, south of ag field] Stream width ±4', Depth ±10", silty sand substrate Dense willows/giant reed - shaded 10% submergent filamentous algae
Species Recorded:	10 UTS (5 adult, 5 juvenile), mosquitofish
Station # 10	GPS location: 34º 26' 12"N 118º 36' 32"W
Habitat Description:	[Small braided channel at base of north bank, south of ag field] Stream width ±4', Depth ±10", silty sand substrate Dense willows/giant reed - shaded 20% submergent filamentous algae
Species Recorded:	12 UTS (5 adult, 2 subadult, 5 juvenile)
Station # 11	GPS location: 34º 26' 07"N 118º 36' 23"W
Habitat Description:	[Primary channel] Stream width ±5', Depth ±14" Gravelly cobble substrate Outer banks relatively dense willows/oak - partially shaded Stream edge grasses/water speedwell/sedge/cattail No submergent algae
Species Recorded:	arroyo chub
Station # 12	GPS location: 34º 26' 06"N 118º 36' 19"W
Habitat Description:	[Primary channel] Stream width ±5', Depth ±18" Gravelly cobble substrate Relatively dense willows/cottonwood - partially shaded Stream edge grasses/water speedwell/sedge/cattail No submergent algae
Species Recorded:	arroyo chub

Station # 13	GPS location: 34º 26' 12"N 118º 36' 18"W
Habitat Description:	[Marshy area/pool on north side of primary channel] Stream width ±4', Depth ±18", silty substrate Dense willow/cottonwood/mule fat - shaded 25% submergent filamentous algae
Species Recorded:	24 UTS (all age classes, one gravid female)
Station # 14	GPS location: 34º 26' 05"N 118º 36' 15"W
Habitat Description:	[Primary channel] Stream width ±5', Depth ±18" Gravelly cobble substrate North bank willows/mule fat - partially shaded Stream edge grasses/water speedwell/sedge/cattail No submergent algae
Species Recorded:	arroyo chub
Station # 15	GPS location: 34º 26' 03"N 118º 36' 09"W
Habitat Description:	[Primary channel] Stream width ±8', Depth ±14" Gravelly cobble substrate Outer clumps of willow/mule fat; Stream edge grass/water speedwell/sedge No submergent algae
Species Recorded:	None
Station # 16	GPS location: 34º 26' 03"N 118º 36' 04"W
Habitat Description:	[Primary channel] Stream width ±8', Depth ±12" Gravelly cobble substrate Outer clumps of willow/mule fat; Stream edge grass/water speedwell/sedge No submergent algae
Species Recorded:	arroyo chub
Station # 17	GPS location: 34º 26' 03"N 118º 36' 04"W
Habitat Description:	[Edge of marshy area north side of primary channel] Stream width ±3', Depth ±4", sandy cobble substrate Relatively dense willow/cottonwood/mule fat - partially shaded No submergent algae
Species Recorded:	Mosquitofish
Station # 18	GPS location: 34º 26' 05"N 118º 36' 04"W
Habitat Description:	[Edge of marshy area north side of primary channel] Stream width ±3', Depth ±4", sandy cobble substrate Dense willow/cottonwood/mule fat - partially shaded No submergent algae
Species Recorded:	12 UTS (10 subadult, 2 adult m)

Station # 19	GPS location: 34º 26' 08"N 118º 35' 52"W
Habitat Description:	[Marshy area north side of primary channel] Stream width ±8', Depth ±6", sandy substrate Dense willow/cottonwood/mule fat - shaded No submergent algae
Species Recorded:	Three (3) adult UTS (1 m, 2 f)
Station # 20	GPS location: 34º 26' 07"N 118º 35' 48"W
Habitat Description:	[Marshy area north side of primary channel] Stream width ±3', Depth ±10", sandy substrate Dense willow/cottonwood/mule fat - shaded No submergent algae
Species Recorded:	mosquitofish
Station # 21	GPS location: 34º 26' 06"N 118º 35' 39"W
Habitat Description:	[Marshy area north side of primary channel] Stream width ±5', Depth ±4", sandy substrate Dense willow/cottonwood/mule fat - shaded No submergent algae
Species Recorded:	Over 25 UTS (all age classes; many juvenile), mosquitofish
Station # 22	GPS location: 34º 26' 06"N 118º 35' 38"W
Habitat Description:	[Marshy area north side of primary channel] Stream width ±5', Depth ±6", sandy substrate Dense willow/cottonwood/mule fat - shaded No submergent algae
Species Recorded:	Five (5)adult UTS (1 m, 4 f [one gravid]), mosquitofish, Arroyo chub
Station # 23	GPS location: 34º 25' 44"N 118º 35' 31"W
Habitat Description:	[Primary channel] Stream width ±15', Depth ±10" Sandy cobble substrate Relatively dense willow/cottonwood; Stream edge grass/mustard/sedge/water speedwell No submergent filamentous algae
Species Recorded:	Arroyo chub/prickly sculpin
Station # 24	GPS location: 34º 25' 41"N 118º 35' 25"W
Habitat Description:	[Primary channel] Stream width ±8', Depth ±18" Cobbly rocky substrate Wooded terraces (willow/cottonwood); Stream edge grass/water speedwell/watercress No submergent filamentous algae
Species Recorded:	Arroyo chub/Santa Ana sucker

Station # 25	GPS location: 34º 25' 39"N 118º 35' 18"W
Habitat Description:	[Primary channel] Stream width ±6', Depth ±18" Sandy cobble substrate Wooded terraces (willow/cottonwood); Stream edge grass/water speedwell/watercress No submergent filamentous algae
Species Recorded:	Arroyo chub
Station # 26	GPS location: 34º 25' 35"N 118º 35' 08"W
Habitat Description:	[At Old Road Bridge] Stream width ±14', Depth ±6", cobble substrate Open scattered willow/mule fat/grass/water speedwell No submergent algae
Species Recorded:	Arroyo chub, mosquitofish
Station # 27	GPS location: 34º 25' 34"N 118º 35' 05"W
Habitat Description:	[Side channel – between I-5 and Old Road bridges] Stream width ±4', Depth ±18", Silty sand substrate Willow/mule fat/cattail/rush/speedwell/watercress No submergent algae
Species Recorded:	One (1) juv UTS, arroyo chub
Station # 28	GPS location: 34º 25' 31"N 118º 34' 57"W
Habitat Description:	[Primary channel, east side of I-5 Bridge] Stream width ±6', Depth ±20", Sandy cobble substrate Scattered willow/mule fat; Stream edge grass No submergent algae
Species Recorded:	arroyo chub
Station # 29	GPS location: 34º 25' 33"N 118º 34' 45"W
Habitat Description:	[Braided channels, downstream of RR crossing] Stream width ±5', Depth ±4", Sandy substrate Scattered mule fat; Stream edge grass/water speedwell/mustard 10% submergent algae
Species Recorded:	arroyo chub, mosquitofish – shallow areas appeared to be nursery for both species
Station # 30	GPS location: 34º 25' 34"N 118º 34' 41"W
Habitat Description:	[Primary channel, at RR crossing] Stream width ±6', Depth ±7", Sandy cobble substrate Willow/cocklebur/sedge/grasses No submergent filamentous algae
Species Recorded:	None

Station # 31	GPS location: 34º 25' 37"N 118º 34' 26"W
Habitat Description:	[River and Creek channel at San Francisquito Creek confluence) Width ±4', Depth ±6", Sandy cobble substrate Willow/cocklebur/nasturtium/sedge/grasses No submergent filamentous algae
Species Recorded:	Two (2) UTS (1 juv, 1 adult m), arroyo chub
Station # 32	GPS location: 34º 25' 43"N 118º 34' 24"W
Habitat Description:	[Marshy area at San Francisquito Creek confluence] Width ±15', Depth ±4" Silty cobble substrate Open willows/cottonwood/rush – partially shaded <10% submergent algae
Species Recorded:	Arroyo chub, mosquitofish
Station # 33	GPS location: 34º 25' 41"N 118º 34' 21"W
Habitat Description:	[Marshy area at San Francisquito Creek confluence] Width ±20', Depth ±10" Silty sand substrate Dense willows/cottonwood/rush - shaded No submergent algae
Sample Results:	Over 25 UTS (all age classes), mosquitofish, arroyo chub
Station # 34	GPS location: 34º 25' 43"N 118º 34' 19"W
Habitat Description:	[Marshy area at San Francisquito Creek confluence] Width ±25', Depth ±8" Silty cobble substrate Dense willows/rush - shaded No submergent algae
Species Recorded:	25+ UTS (all age classes),
Station # 35	GPS location: 34º 25' 44"N 118º 34' 15"W
Habitat Description:	[Edge of marshy area at San Francisquito Creek confluence] Width ±8', Depth ±4" Silty cobble substrate Willows/cottonwood/smartweed/grasses - partially shaded No submergent algae
Species Recorded:	Six (6) juvenile UTS, mosquitofish

Station # 36	GPS location: 34º 25' 35"N 118º 34' 11"W
Habitat Description:	[One of three channel braids] Stream width ±6', Depth ±6"; Sandy cobble substrate Cattail/smartweed <5% submergent filamentous algae
Species Recorded:	Four (4) adult UTS (3f, 1m), mosquitofish (western toad tadpoles)
Station # 37	GPS location: 34º 25' 30"N 118º 33' 55"W
Habitat Description:	[Small side channel] Stream width ±2', Depth ±2", Sandy substrate Scattered grasses/smartweed No submergent filamentous algae
Species Recorded:	One (1) adult UTS (f), arroyo chub
Station # 38	GPS location: 34º 25' 30"N 118º 33' 47"W
Habitat Description:	[Open channel] Stream width ±10'; Depth ±6"; Sandy cobble substrate Grasses/smartweed on both banks <5% submergent filamentous algae
Species Recorded:	None
Station # 39	GPS location: 34º 25' 30"N 118º 33' 42"W
Habitat Description:	[Smaller side channel, west side of McBean Bridge] Stream width ±2', Depth ±4"; Cobble substrate Smartweed, grasses, cattail, young willows on both banks No submergent algae
Species Recorded:	Mosquitofish
Station # 40	GPS location: 34º 25' 28"N 118º 33' 40"W
Habitat Description:	[Slow side channel near McBean Bridge] Stream width ±4'; Depth ±2"; Sandy silt substrate Relatively dense smartweed/mule fat/young willow on both banks No submergent filamentous algae
Species Recorded:	Four (4) subadult UTS, arroyo chub
Station # 41	GPS location: 34º 25' 25"N 118º 33' 28"W
Habitat Description:	[Primary channel] Stream width ±8'; Depth ±4" Sandy cobble substrate Both banks relatively dense willow/mule fat/smartweed/grasses 10% submergent filamentous algae
Species Recorded:	None

Station # 42	GPS location: 34º 25' 20"N 118º 33' 22"W
Habitat Description:	[Secondary braid in South Fork near confluence] Stream width ±3'; Depth ±2"; Sandy substrate Relatively open with willow, mule fat, smartweed, grass <5% submergent algae
Species Recorded:	Four (4) subadult UTS
Station # 43	GPS location: 34º 25' 24"N 118º 33' 08"W
Habitat Description:	[Secondary braid of channel] Stream width ±2'; Depth ±2" cobble substrate smartweed, grass, cattail, small willows <5% submergent filamentous algae
Species Recorded:	Mosquitofish
Station # 44	GPS location: 34º 25' 29"N 118º 32' 47"W
Habitat Description:	[Confluence of primary and secondary stream braids] Stream width ±10'; Depth ±14"; Sandy cobble substrate Willows, few cottonwood, giant reed, No submergent algae
Species Recorded:	None
Station # 45	GPS location: 34º 25' 30"N 118º 32' 43"W
Habitat Description:	[Primary channel] Stream width ±8'; Depth ±12"; Sandy substrate; dense cattails No submergent algae
Species Recorded:	None
Station # 46	GPS location: 34º 25' 31"N 118º 32' 36"W
Habitat Description:	[Secondary braid of channel] Stream width ±15'; Depth ±4"; Sandy cobble substrate Both banks relatively open with patches of willow, mule fat, smartweed, cattail, grass <10% submergent filamentous algae
Species Recorded:	Mosquitofish
Station # 47	GPS location: 34º 25' 30"N 118º 32' 31"W
Habitat Description:	[Near confluence w/ Bouquet Creek] Stream width ±6'; Depth ±6"; Sandy substrate; open cattail, willows Approximately 20% submergent filamentous algae
Species Recorded:	Mosquitofish

Station # 48	GPS location: 34º 25' 26"N 118º 32' 23"W
Habitat Description:	[Large outflow pipe from development to north] Stream width ±6'; Depth ±3'; Silty sand substrate Pool at base of pipe outflow, apparently planted with mule fat and willow. Cattails present. Dense filamentous algae
Species Recorded:	Sailfin molly, goldfish, largemouth bass

Impact Sciences, Assessment and Survey of Mammals within the Newhall Ranch Specific Plan Area

FORTHCOMING WILL BE INCLUDED UPON FINAL SUBMITTAL

Guthrie, Bird Surveys

Bird Surveys Along the Santa Clara River, 2004 Mouth of the Castaic Creek Downstream to Just Below Las Brisas Crossing

BIRD SURVEYS ALONG THE SANTA CLARA RIVER, 2004

MOUTH OF CASTIAC CREEK DOWNSTREAM TO

JUST BELOW LAS BRISAS CROSSING

Prepared for:

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August 24, 2004

REVISED

Bird Surveys along the Santa Clara River, 2004
Mouth of Castaic Creek Downstream to just below Las Brisas Crossing

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Nature and Scope of Surveys

During the spring and early summer of 2004 surveys were conducted along the section of the Santa Clara River between its confluence with Castaic Creek and a point 1/4 mile below the Las Brisas bridge over the Santa Clara River. The total length of the section surveyed was 7.5 miles.

Eight surveys were conducted in accordance to the U.S. Fish and Wildlife Service Protocol for least Bell's vireo. Five of the surveys were conducted within the time frames recommended by the U.S. Fish and Wildlife Service Protocol for southwestern willow flycatcher. In order to follow least Bell's vireo protocol on kilometers covered per day, each portion (one in Los Angeles and one in Ventura County) was divided into two sections, each surveyed separately. However, observations from these two surveys are combined in data presentation (Tables 1-2).

Each survey was conducted on foot by observers well acquainted with both visual and auditory and behavioral characteristics of southern California birds. Surveys occurred approximately every other week between mid April and mid July (there was some variation in timing to avoid periods of poor weather) and occurred between 6:30 and 10:30 a.m. All birds sighted were counted, but special emphasis was placed on finding focus species, Species of Special Concern, and brown-headed cowbirds. If focus species (yellow-billed cuckoo, least Bell's vireo, southwestern willow flycatcher), were not visually observed, tapes of their calls were played in an attempt to elicit a response. Personnel for all surveys were Daniel A. Guthrie and Judith A. Sugden, both working under Federal Fish and Wildlife Service Permit number TE810394-2, issued under section 10(a)(1)(A) of the Endangered Species Act and permitted for both least Bell's vireo and southwestern willow flycatcher. and under an MOU from State of California Department of Fish and Game, dated April 23, 2003, also for these species.

Habitat Condition and Bird Observations

Flooding during late winter and early spring of 2004 scoured many sections of the river bed, particularly in the portion in Los Angeles County. The result was extensive sandy areas and little wet riparian vegetation during April and May. Only along the narrower river section in Ventura County was the damage from flooding less severe. The flooding also resulted in a deepening of the river channel, leaving many sections adjacent to it dry.

Observations of all birds are shown in Tables 1-2. The numbers shown are of birds seen and heard, with heard individuals forming the majority of the observations. Numbers vary between censuses for several reasons. Bird activity varies with season. Different species breed at different times of the year. In general, species are most easily observed when they are actively defending territories by song during the establishment of breeding pairs. Once pairs are established and nesting begins song often decreases and the numbers of birds observed, therefore, also decreases. After young leave the nest, the number of birds observed increase. Thus, for most resident species, numbers of adult birds are most accurately censused in April and May, when territorial activity is at a maximum. A few species such as Anna's hummingbird that nest early in the season may be underestimated. Numbers of nesting species observed may be higher than normal in May due to migratory birds passing through the area, then decrease slightly in June and early July when birds are less active during nesting, and may increase in late June and July when young birds leave the nest. Increases in some species also occur in July when species resident in nearby habitats visit the riparian zone to feed on elderberry and other wet riparian plants.

Comments on Threatened and Endangered Species

Yellow-billed Cuckoo *(Coccyzus americanus)*

The Yellow-billed Cuckoo is listed as a State Endangered Species. Despite playing taped calls of this species during June and July surveys, when this species might be present, no individuals of this species were observed in 2004.

Southwestern Willow Flycatcher *(Empidonax traillii extimus)*

This subspecies is listed as Federally Endangered under the Federal Endangered Species Act. Willow flycatchers were once widespread in wet riparian woodland in southern California but now fewer than 70 pair remain, with the major concentrations being along the Kern River and the Santa Margarita River in San Diego County. Following the Revised Protocol (Fish And Wildlife Service, July 2000) five surveys (see tables 1-2 for dates) were conducted specifically for southwestern willow flycatcher. All surveys occurred between 6:00 and 10:00 am. and used taped calls to elicit a response if flycatchers were not first observed.

A single willow flycatcher was observed on May 31st just upstream from the Ventura/Los Angeles County line. (Figure 3). Attempts to relocate this bird on subsequent visits were unsuccessful. There were no sightings of willow flycatcher along the Ventura County section of the river in 2004 (Figure 4).

Willow flycatchers are fairly common migrants through southern California and most of the migrants are believed to be of the more northern common subpsecies of willow flycatcher, *E. t. brewsteri,* which breeds throughout southern Canada and the northern United States, rather than representatives of the southwestern subspecies *E. t. extimus*. Southwestern willow flycatchers are positively identified primarily by nesting within the geographic area of their range or by measurements of in hand specimens. Since May 31st is during the period when the northern subspecies is migrating through the area, and lacking any subsequent evidence of nesting, this observations of a willow flycatcher cannot be positively identified as belonging to the southwestern form of willow flycatcher.

The report forms required by the survey protocol for this species are attached and will be forwarded to the Ventura Office of the U.S. Fish and Wildlife Service.

Least Bell's Vireo *(Vireo bellii pusillus)*

Surveys of the wet riparian areas along the Santa Clara River followed U.S. Fish and Wildlife Service Guidelines for least Bell's vireo. Eight surveys were conducted between April 10 and July 31 (see tables 1-2 for dates). All surveys occurred between 6:00 and 10:00 am. The least Bell's vireo is a very vocal species and most birds were located without the use of taped calls. However, tapes were used to elicit responses in early spring, before vireo arrival, in late summer, when vireos were less vocal, and in areas of marginal habitat or where vireos were expected from previous sightings but could not be heard. A calling vireo was considered a territorial male. If a second, silent bird was observed in the same area, a pair was considered to be present. However, to avoid disturbance, no efforts were made to find nests, locate with certainty females in territories, or to locate fledged young in established territories. Numbers of vireos shown in Tables 1 and 2 are actual numbers of birds observed. These numbers include all vireos, both singing and silent. In order to avoid disturbing vireos, no special efforts were made to determine nesting success or presence of leg bands once birds were observed. However, at each location where vireos were found, they were observed at least once, and no leg bands were observed.

Least Bell's vireos were regularly heard and seen in two locations, one in Ventura County and one in Los Angeles County. Vireos have been seen in the Ventura area, (Figure 1, area 1) for several years prior to 2004. There were up to 9 territorial males and a minimum of 7 mated pair nesting along this section of the river.

Least Bell's vireo were also found at a single location in Los Angeles County (Area 3 , Figure 2), another place where sightings of vireos have occurred in previous years. This area supported a minimum of 5 territorial males and at least 4 pair of birds.

Other areas along the river where least Bell's vireos were found in the past (Figures 1, area 2; Figure 2, areas 4,5)) were carefully surveyed during 2004, but no vireos were found.

Comments on Sensitive Species

Great Blue Heron *(Ardea herodias)*

Great Blue Herons are listed on the California Natural Diversity Data Base as a species that warrants monitoring. Individuals of this species was observed sparingly along the river after the breeding season and along other sections of the river during winter and migration. No nesting was observed.

Great Egret (Ardea alba)

The great egret is listed on the California Natural Diversity Data Base as a species that warrants monitoring. Individuals of this species was observed sparingly along the river after the breeding season and along other sections of the river during winter and migration. No nesting was observed.

White-tailed Kite (*Elanus leucurus*)

This species is considered a Species of Management Concern by the U.S. Fish and Wildlife Service. Hunting kites were regularly observed along the river but apparently nested further east near the trailier village at Castaic Junction.

Cooper's Hawk *(Accipiter cooperii)*

Cooper's hawk is considered a Species of Special Concern by the State of California. Cooper's hawks were regularly observed hunting along Ventura County section of the river and nested in the area.

Yellow Warbler *(Dendroica petechia)*

The yellow warbler is considered a Species of Special Concern by the State of California. Yellow warblers prefer wet riparian habitat but are also found in large cottonwoods in drier riparian areas. Singing yellow warblers were observed throughout the survey period in small numbers. Most sightings were in the areas where least Bell's vireos were present (Figures 1-2)

Yellow-breasted Chat *(Icteria virens)*

The yellow-breasted chat is considered a Species of Special Concern by the State of California. The numbers of chats calling from territories along this section of riparian woodland are about the same number as observed here in previous years.. Most sightings were in the areas where least Bell's vireos were present (Figures 1-2) . A few additional birds were regularly heard in a dry riparian woodland on the north side of the river (Area 4 in Figure 2).

Tricolored Blackbird (*Agelaius tricolor*)

This species is considered a California Special Concern species by the Department of Fish and game and is also a Federal Special Concern Species. A small colony of tricolored blackbirds nested one year in the 1990's along Castaic Creek and in recent years, one or two sightings of migratory individuals have occurred most years. In 2004 there were no sightings of this species.

Lawrence's Goldfinch *(Carduelis lawrencei)*

This species is a highest priority species on the Audubon Birds to Watch list for 1996 and is a Bird of Management Concern for the Fish and Wildlife Service. Although a species of the coastal sage, a few individuals of this species visited the riparian zone of the Santa Clara River after their nesting season.

Comments on Brown Headed Cowbird *(Molothrus ater)*

Cowbirds were regularly observed in all sections of the study area and seemed to be attracted by tapes of least Bell's vireo calls. Numbers remained high along the river throughout the survey period.

Summary

No yellow billed cuckoos were observed during 2004. There was a single observation of a willow flycatcher. Because of the date of observation and failure to relocate the bird on subsequent visits, it is likely that this bird represented the common northern subspecies of willow flycatcher *(E. t. brewsteri)* rather than the endangered southern California subspecies *(E. t. extimus)*.

Between 11 and 14 pair of least Bell's vireos were observed in two locations long this section of the Santa Clara River during 2004. This is a slight increase from previous years. This greater success in in line with the greater nesting success and population increase of this species statewide.

Among species of concern, the riparian species; yellow warbler and yellow-breasted chat occurred in small numbers in riparian woodlands along the river. There were several observations of two raptors, the white-tailed kite and Cooper's hawk. Both species nest in riparian woodlands. Two wintering and migrant species of concern, great blue heron and great egret, were observed feeding in small numbers on the river, but did not nest in the area. Finally, one coastal sage species, Lawrence's goldfinch, was observed along the river in small numbers as a visitor from nearby coastal sage habitat.

Table 1. BIRDS OBSERVATIONS ALONG THE SANTA CLARA RIVER,2004: Santa Clara River from the mouth of Castaic Creek downstream to the Los Angeles/Ventura County Line.

Endangered Species and Species of Concern Shaded

		Dates of Surveys							
SPECIES	**STATUS**	**4/15,22**	**5/6,7**	**5/19,20**	**5/30,31**	**6/10,13**	**6/25,29**	**7/3,5**	**7/14.15**
Great Blue Heron	m,w	1	0	0	0	0	0	0	0
Great Egret	m	0	0	0	0	0	0	0	0
Snowy Egret	m,w	1	0	0	0	0	0	0	1
Green Heron	r	0	1	2	0	0	1	1	2
Black-crowned Night-heron	m,w	0	1	0	0	0	0	0	0
Turkey Vulture	s	1	0	0	0	2	0	1	0
Mallard	r	21	9	6	8	3	10	2	7
White-tailed Kite	r	0	0	0	0	2	0	0	0
Red-shouldered Hawk	r	0	2	0	1	3	2	6	0
Red-tailed Hawk	r	1	1	1	3	1	3	3	1
American Kestrel	r	1	2	1	4	2	1	0	0
California Quail	r	38	26	18	28	45	15	31	52
Killdeer	r	20	18	18	19	20	14	5	9
Solitary Sandpiper	m	0	1	0	0	0	0	0	0
Spotted Sandpiper	s	2	4	7	2	7	11	5	7
Least Sandpiper	m	6	0	0	0	0	0	0	0
Western Gull	m,	0	0	10	0	35	0	7	0
Rock Dove	r	84	10	2	40	0	0	0	0
Mourning Dove	r	20	10	22	16	14	12	17	28
Greater Roadrunner	r	0	1	0	1	0	0	0	0
White-th. Swift	r	0	0	8	6	0	0	0	0
Anna's Hummingbird	r	1	1	1	5	3	2	12	4
Costa's Hummingbird	s	0	0	0	0	0	0	0	1
Belted Kingfisher	m	0	0	0	0	0	0	1	1
Nuttall's Woodpecker	r	5	7	6	5	7	8	15	7
Hairy Woodpecker	r	0	1	0	0	0	0	0	0
Northern Flicker	r	0	1	0	1	0	2	1	0
Willow Flycatcher	s	0	0	0	1	0	0	0	0
Pacific Slope Flycatcher	s	1	2	1	0	0	0	0	1
Black Phoebe	r	0	0	0	0	1	3	1	12
Ash-throated Flycatcher	s	9	23	17	7	14	16	10	11
Western Kingbird	s	4	0	5	1	2	0	2	4
Bell's Vireo	s	2	2	3	4	2	4	0	1
Warbling Vireo	m	1	0	0	0	0	0	0	0
Western Scrub Jay	r	10	16	14	14	9	10	15	10
American Crow	r	16	10	11	11	8	45	63	26
Common Raven	r	15	10	5	2	15	32	21	6
Tree Swallow	s	2	6	5	0	6	6	0	0
Violet-green Swallow	s	0	3	0	3	4	1	3	0
N. Rough-winged Swallow	s	5	7	5	10	8	11	3	6
Cliff Swallow	s	50	44	100	30	48	6	30	17
Barn Swallow	s	0	1	0	0	0	0	2	2
Oak Titmouse	r	11	8	4	8	7	4	6	7
Bushtit	r	4	4	6	2	0	13	7	3

Table 1 (cont.). BIRDS OBSERVATIONS ALONG THE SANTA CLARA RIVER,2004: Santa Clara River from the mouth of Castaic Creek downstream to the Los Angeles/Ventura County Line.

Endangered Species and Species of Concern Shaded

		Dates of Surveys							
SPECIES	**STATUS**	**4/15,22**	**5/6,7**	**5/19,20**	**5/30,31**	**6/10,13**	**6/25,29**	**7/3,5**	**7/14,15**
Bewick's Wren	r	21	27	20	21	9	10	10	11
House Wren	r	27	32	17	6	1	0	3	0
Western Bluebird	r	12	6	7	6	12	12	15	7
American Robin	r	1	0	0	0	1	0	0	0
Wrentit	r	7	6	2	5	5	10	4	1
California Thrasher	r	1	1	0	0	0	1	0	1
European Starling	r	19	13	11	5	27	22	4	19
Phainopepla	r	0	0	4	1	1	2	5	2
Nashville Warbler	m	1	0	0	0	0	0	0	0
Yellow Warbler	s	7	7	5	5	15	1	0	2
Yellow-rumped Warbler	w,m	8	0	0	0	0	0	0	0
MacGillivray's Warbler	m	1	0	0	0	0	0	0	0
Common Yellowthroat	r	7	18	26	16	29	20	5	13
Wilson's Warbler	m	2	1	0	1	0	0	0	0
Black-headed Grosbeak	s	11	0	14	9	4	2	2	0
Western Tanager	m	0	0	1	0	0	0	0	0
Spotted Towhee	r	9	16	12	16	10	9	6	2
California Towhee	r	6	24	16	24	10	16	25	18
Lark Sparrow	r	0	0	0	0	0	0	10	9
Savannah Sparrow	w,m	2	0	0	0	0	0	0	0
Song Sparrow	r	24	68	60	44	46	24	31	36
Lincoln's Sparrow	m	1	0	0	0	0	0	0	0
White-crowned Sparrow	w,m	3	0	0	0	0	0	0	0
Black-headed Grosbeak	s	11	20	14	23	18	6	5	4
Blue Grosbeak	s	0	2	4	5	6	2	7	9
Lazuli Bunting	s	0	0	0	0	0	0	8	3
Red-winged Blackbird	s	7	87	390	127	48	2	11	0
Western Meadowlark	r	0	0	0	1	0	0	0	0
Brewer's Blackbird	r	35	10	2	0	0	0	4	0
Great-tailed Grackle	r	0	0	0	3	0	0	0	0
Brown-headed Cowbird	s	9	15	9	6	4	4	4	5
Bullock's Oriole	s	15	2	0	4	5	0	4	4
House Finch	r	18	18	33	56	22	36	72	60
Lesser Goldfinch	r	3	0	1	12	0	11	8	9
Lawrence's Goldfinch	s	14	0	0	0	0	2	0	0
House Sparrow	r	0	0	0	0	3	0	0	0

Status: m, migrant; r, resident; s, summer only; w, winter
numbers in parentheses are nestlings.

Table 2. Bird Observations along the Santa Clara River; Los angeles/Ventura County Line

West to 1/4 mile beyond Las Brisas Bridge.

Endangered Species and Species of Concern Shaded

		Dates of Surveys							
SPECIES	**STATUS**	**4/22**	**5/7**	**5/20**	**5/31**	**6/13**	**6/25**	**7/5**	**7/15**
Great Blue Heron	m,w	0	0	0	0	3	1	1	0
Great Egret	m,w	0	0	0	0	0	0	2	1
Snowy Egret	m,w	1	0	0	0	0	0	0	0
Green Heron	r	4	0	3	1	3	2	2	2
Mallard	r	11	10	3	3(8)	6	4	4	8(10)
White-tail Kite	r	1	0	0	1	0	0	1	1
Cooper's Hawk	r	1	0	1	0	0	0	0	1
Red-shouldered Hawk	r	1	1	2	2	2	0	2	2
Red-tailed Hawk	r	2	1	1	2	1	2	1	1
Golden Eagle	r	1	0	0	0	0	0	0	0
American Kestrel	r	0	0	2	0	1	0	0	0
California Quail	r	4	34	18	23	26	18	12	15
Killdeer	r	15	14	12	6	18	9	6	4
Spotted Sandpiper	s	0	5	2	1	4	2	0	3
Least Sandpiper	m	4	0	0	0	0	0	0	0
Western Gull	m	0	0	0	0	9	0	0	0
Rock Dove	r	8	0	0	16	0	8	0	0
Mourning Dove	r	20	11	70	34	55	34	29	12
Common Ground Dove	r	0	2	0	0	0	0	0	0
Greater Roadrunner	r	0	0	0	0	0	0	0	1
Vaux's Swift	m	20	0	0	0	0	0	0	0
White-th. Swift	r	0	1	4	4	0	0	0	2
Black-chinned Hummingbird	s	1	0	1	1	0	0	0	1
Anna's Hummingbird	r	2	5	2	6	9	10	9	17
Costa's Hummingbird	s	0	0	0	0	1	0	0	0
Allen's Hummingbird	r,m	0	0	0	2	0	0	0	0
Belted Kingfisher	m	3	0	0	1	0	0	0	0
Acorn Woodpecker	r	0	0	0	0	0	0	0	8
Nuttall's Woodpecker	r	4	6	6	5	8	10	9	4
Downy Woodpecker	r	1	1	7	5	4	3	1	4
Hairy Woodpecker	r	3	2	3	2	0	3	2	0
Northern Flicker	r	0	2	1	1	0	0	0	0
Western Wood-Pewee	m	1	0	0	0	0	0	0	0
Pacific Slope Flycatcher	s	3	3	5	0	2	1	1	1
Black Phoebe	r	6	9	4	11	18	12	4	16
Say's Phoebe	r	1	0	0	1	0	0	0	0
Ash-throated Flycatcher	s	15	24	14	11	14	24	12	8
Cassin's Kingbird	s	0	0	0	2	0	0	0	0
Western Kingbird	s	2	2	0	4	2	2	2	0
Bell's Vireo	s	0	0	1	1	1	0	1	1
Western Scrub Jay	r	12	25	15	7	12	14	15	8
American Crow	r	21	6	22	14	15	15	23	67
Common Raven	r	12	6	4	4	2	3	11	1

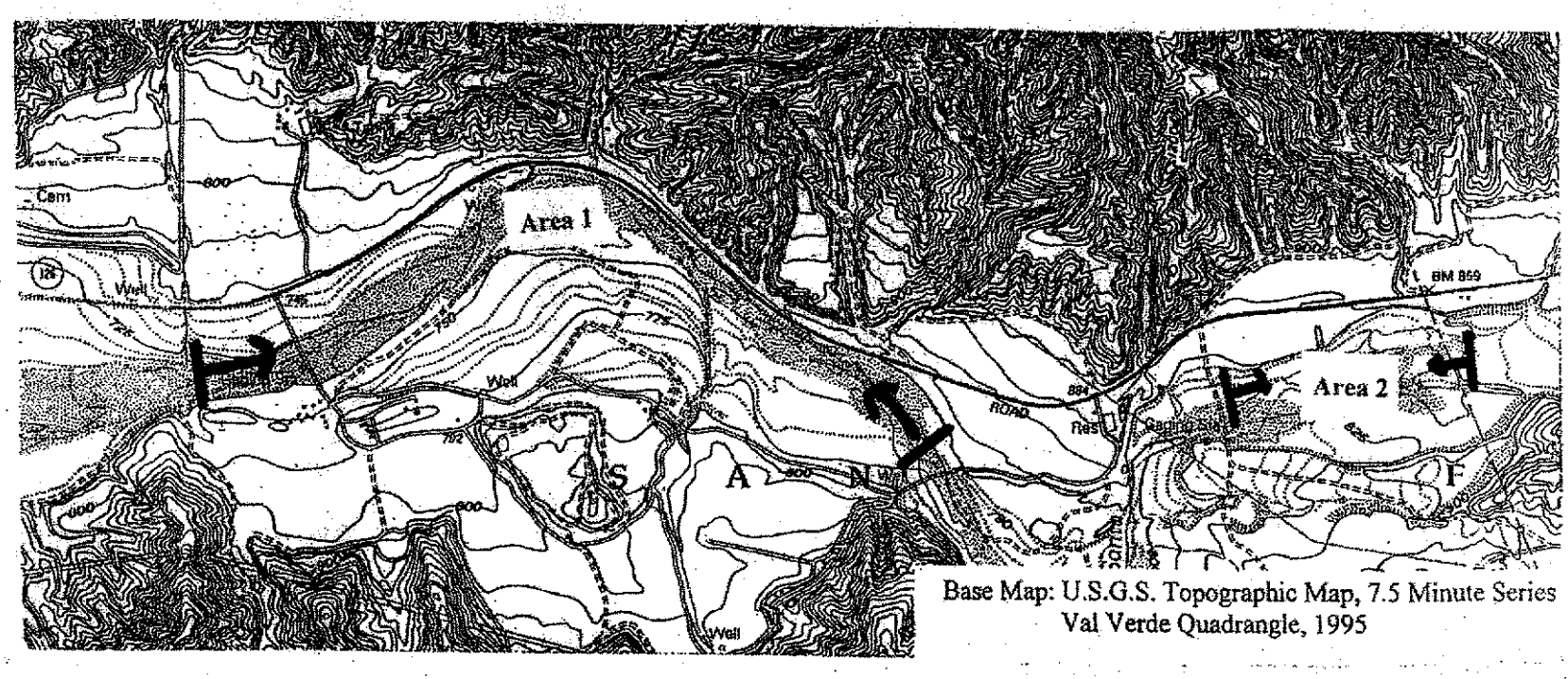
Table 2 (cont.). Bird Observations along the Santa Clara River; Los angeles/Ventura County Line
West to 1/4 mile beyond Las Brisas Bridge.

Endangered Species and Species of Concern Shaded

				Dates of Surveys					
SPECIES	**STATUS**	**4/22**	**5/7**	**5/20**	**5/31**	**6/13**	**6/25**	**7/5**	**7/15**
Tree Swallow	s	0	0	0	2	0	0	3	0
Violet-green Swallow	s	0	0	5	1	2	0	0	0
N. Rough-winged Swallow	s	0	3	10	12	7	14	6	2
Cliff Swallow	s	320	220	103	212	266	200	130	12
Barn Swallow	s	0	0	0	0	0	3	1	0
Oak Titmouse	r	5	5	12	5	6	3	14	5
Bushtit	r	10	4	16	16	21	15	48	40
Bewick's Wren	r	28	37	41	20	22	16	3	12
House Wren	r	10	8	15	13	6	0	0	2
Western Bluebird	r	0	4	0	0	1	4	0	1
American Robin	r	0	5	6	6	1	0	0	0
Wrentit	r	9	14	17	8	11	16	22	15
California Thrasher	r	2	1	2	3	6	0	2	4
European Starling	r	14	15	19	8	3	0	0	0
Phainopepla	r	0	2	3	6	5	0	0	0
Yellow-rumped Warbler	w,m	7	0	0	0	0	0	0	0
Common Yellowthroat	r	38	50	97	68	120	33	54	89
Wilson's Warbler	m	8	1	0	0	0	0	0	0
Spotted Towhee	r	25	21	35	27	27	27	14	7
California Towhee	r	36	45	59	30	39	8	20	26
Lark Sparrow	r	0	0	0	1	0	0	0	0
Song Sparrow	r	76	120	224	76	139	60	64	97
Black-headed Grosbeak	s	22	15	26	25	33	15	18	1
Blue Grosbeak	s	0	3	3	1	17	9	12	8
Lazuli Bunting	s	4	19	1	0	0	7	4	29
Red-winged Blackbird	s	18	1	15	2	3	4	0	0
Brewer's Blackbird	r	0	8	3	3	2	80	60	0
Great-tailed Grackle	r	0	0	0	0	2	0	0	0
Brown-headed Cowbird	s	15	38	40	30	39	11	23	18
Hooded Oriole	s	5	0	0	2	0	2	0	0
Bullock's Oriole	s	7	0	8	15	3	3	3	2
House Finch	r	26	31	27	55	84	60	48	42
Lesser Goldfinch	r	66	48	72	62	75	21	38	54
American Goldfinch	w,m,r	6	4	2	10	17	0	0	0
Nutmeg Manikin	r	0	0	1	0	0	0	0	0

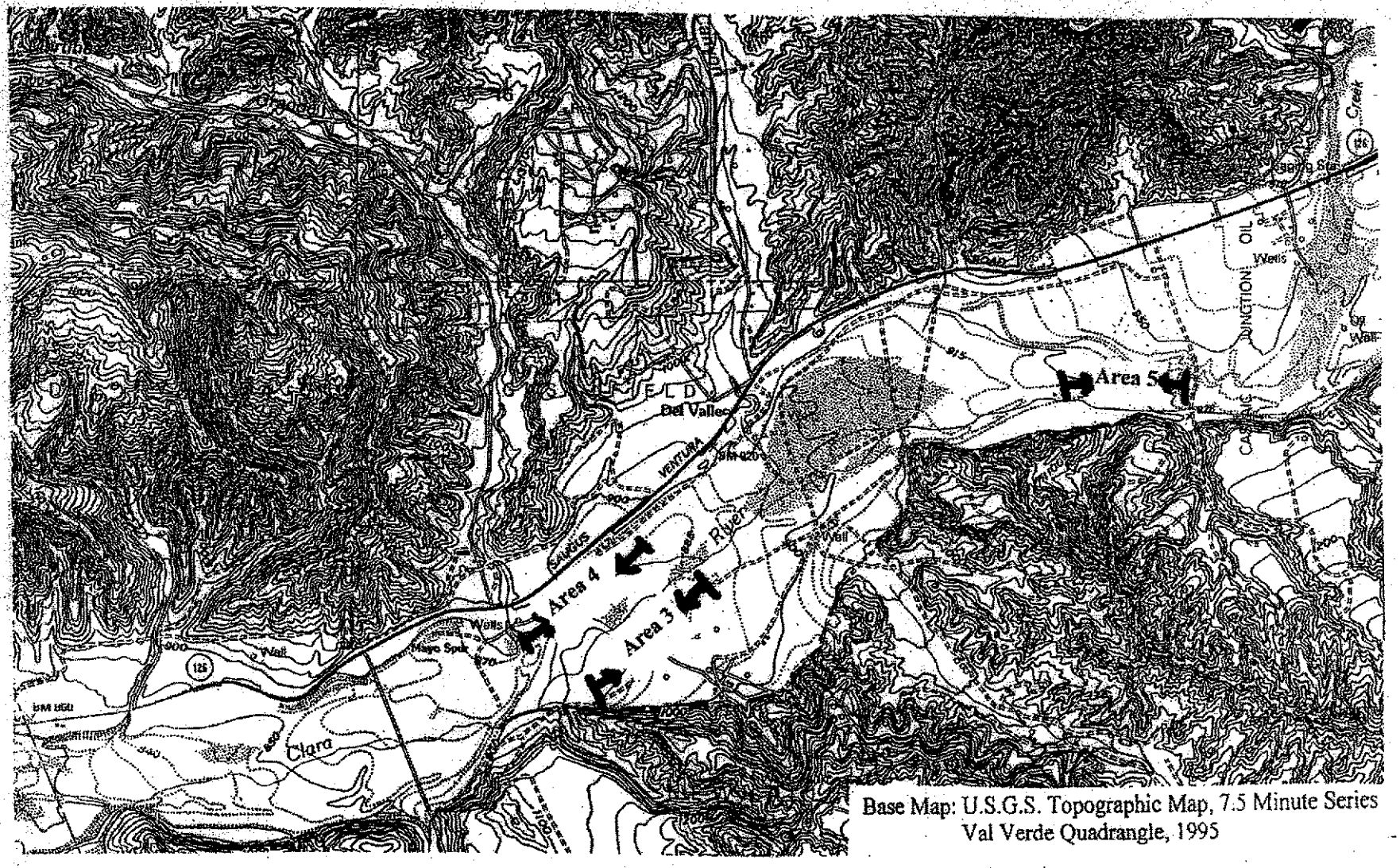
Status: m, migrant; r, resident; s, summer only; w, winter
numbers in parentheses are nestlings

Figure 1. Locations of Least Bell's Vireo breeding records along the upper reaches of the Santa Clara River in Ventura County.



Base Map: U.S.G.S. Topographic Map, 7.5 Minute Series
Val Verde Quadrangle, 1995

Figure 2. Location of Least Bell's Vireo breeding records along the Santa Clara River in Los Angeles County.



Base Map: U.S.G.S. Topographic Map, 7.5 Minute Series
Val Verde Quadrangle, 1995

Willow Flycatcher Survey and Detection Form (rev. 4/98)

Site Name____Santa Clara River: Newhall Ranch, Los Angeles County_____Total Site No _____

Was site surveyed in previous year? Yes No Drainage Santa Clara River
If yes, what site name was used? __lower Santa Clara River_____
County __Los Angeles_____ State__CA____ USGS Quad Name Val Verde____

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? X☐ *Yes* ☐ *No*
Site Coordinates: Start: N__34 25.300_____ W 118 36.755_____ UTM
Stop: N__34 24.197_____ W 118 41.307_____ UTM Zone _____
Elevation ____840-950 ft._____ feet / meters (circle one)

***** Fill in additional site information on back of this page *****

Survey # Observer(s)	Date (m/d/y) Survey time	Number of WIFLs Found	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign Y or N	Comments about this survey (e.g., evidence of pairs or breeding; number of nests, nest contents or number of fledges seen; potential threats)
D. Guthrie	Date 5/30,31, start 6:30-9:30 6:30-7:30 total hrs _4.0	1	0	0	n	Y	Y	Non singing
D. Guthrie	Date 6/10,13 Start 6:30-9 6:30 – 7:30 total hrs _3.5	0	0	0	n	Y	Y	
D. Guthrie	Date 6/25,29 Start 6:30-9:00 6:30 -7:30 total hrs 3.50_	0	0	0	n	Y	Y	
D. Guthrie	Date 7/3,5 start 6 :30-- 9:00 6:30-7:30 total hrs 3.5	0	0	0	n	Y	Y	?
D. Guthrie	Date 7/13,16 start 6:30-8:30 6:30 - 7:30 total hrs _3.0_	0	0	0	n	Y	Y	

Overall Site Summary (Total only resident WIFLs)	Adults	Pairs	Territories	Nests	Were any WIFLs color-banded? No
Total survey hrs___17.5	1	0	0	0	If yes, report color combination(s) in the comments section on back of form

Name of Reporting Individual ____Dan Guthrie_____ Date Report Completed ___7/20/04_____

Submit the original of this form. Retain a copy for your records.

Fill in the following information completely. Submit original form. Retain copy for your records.

Name of Reporting Individual ___Dan Guthrie_____Phone # _909 607 2836_____

Affiliation __Claremont Colleges_____ Email dguthrie@jsd.claremont.edu_____

Site Name__Santa Clara River:Newhall Ranch, los Angeles County
Did you verify that this site name is consistent with that used in previous years? Yes No ? (circle one)
This is a section of site previously lumped as lower Santa Clara River
Management Authority for Survey Area (circle one):

Federal Municipal/County State Tribal **Private**

Name of Management Entity or Owner (e.g., Tonto National Forest) _Newhall Land Co._____

Length of area surveyed: _4 miles_____ (specify units, e.g., miles = mi, kilometers = km, meters = m)

Did you survey the same general area during each visit to this site this year? **Yes /** If no, summarize in comments below.

If site was surveyed last year, did you survey the same general area this year? **Yes /** If no, summarize in comments below.

Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):

XX Native broadleaf plants

☐ Mixed native and exotic plants (mostly native)
(entirely or almost entirely, includes high-elevation willow)

☐ Mixed native and exotic plants (mostly exotic) ☐ Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrub species: __Cottonwood, willow, _____

Average height of canopy: __40 ft._____ (specify units)

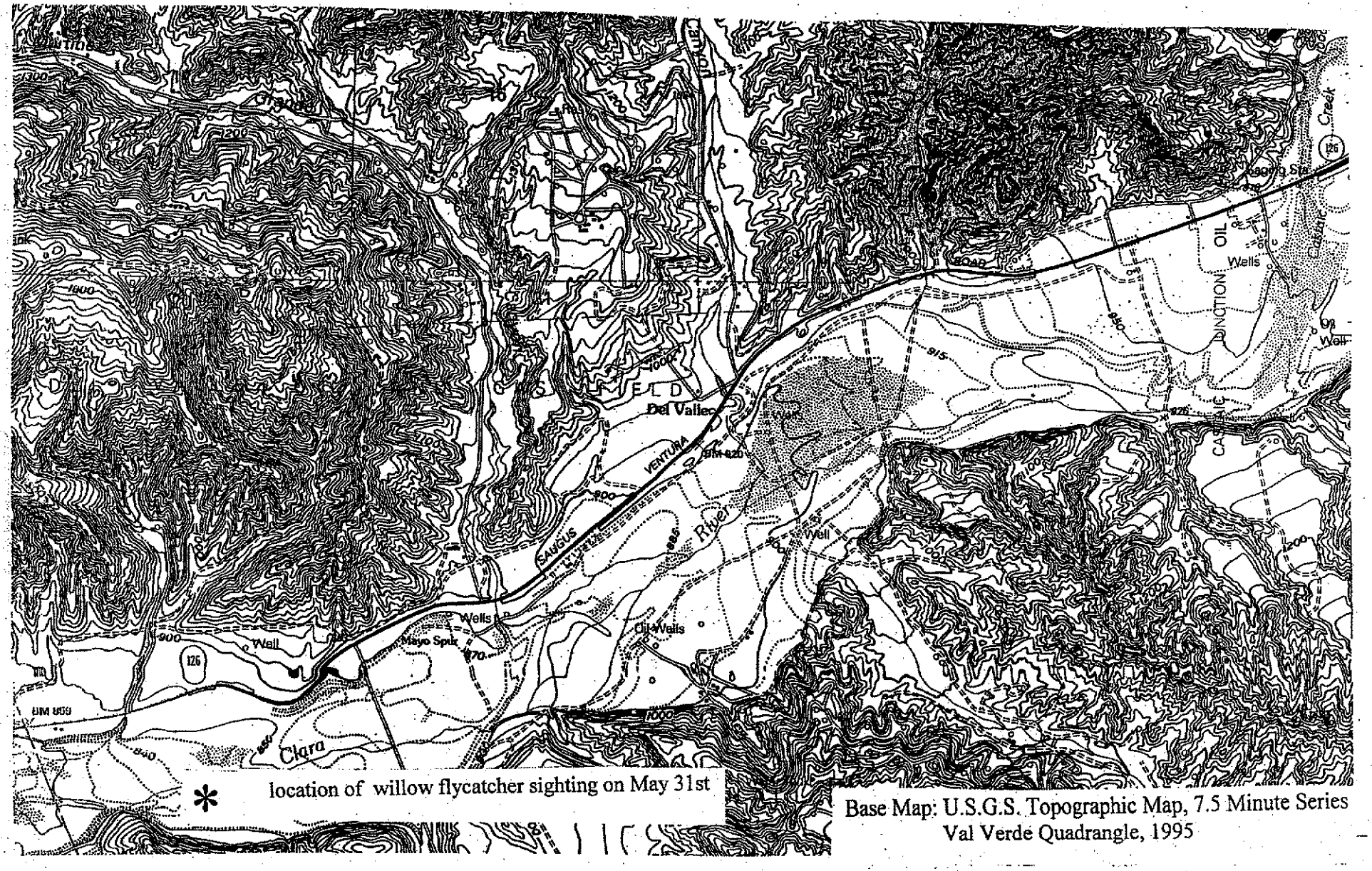
Was surface water or saturated soil present at or adjacent to site? YES
Distance from the site to surface water or saturated soil: _____ (specify units)

Did hydrological conditions change significantly among visits (did the site flood or dry out)? **No** (circle one)
If yes, describe in comments section below. no water present except for 50 yd section trickle in center of section.

Remember to attach a xerox copy of a USGS quad/topographical map (REQUIRED) of the survey area, noting the survey site and location of WIFL detections. You may also include a sketch or aerial photograph showing details of site location, patch shape, survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map.

Comments (attach additional sheets if necessary):_____
_____
_____bird observed thought to be a migrant of a northern subspecies.
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Figure 3. Map of area surveyed in 2004, showing location of Willow Flycatcher sighting.



Base Map: U.S.G.S. Topographic Map, 7.5 Minute Series
Val Verde Quadrangle, 1995

Willow Flycatcher Survey and Detection Form (rev. 4/98)

Site Name____Santa Clara River, Newhall Ranch, Ventura Co._____ Total Site No _____

Was site surveyed in previous year? Yes No Drainage Santa Clara River
If yes, what site name was used? __Lower Santa Clara River _____
County __Ventura_____ State__CA____ USGS Quad Name Val Verde____

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? X☐ *Yes* ☐ *No*
Site Coordinates: Start: N__34 24.197_____ W 118 41.307_____ UTM
Stop: N__34 24.265_____ W 118 44.370_____ UTM Zone _____
Elevation ____725-850 ft._____ feet / meters (circle one)

***** Fill in additional site information on back of this page *****

Survey # Observer(s)	Date (m/d/y) Survey time	Number of WIFLs Found	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign Y or N	Comments about this survey (e.g., evidence of pairs or breeding, number of nests, nest contents or number of fledges seen; potential threats)
D. Guthrie J.Sugden_____ _____	Date 5/20 start 6.45 stop 9:15 total hrs _2.5_	0	0	0	n	Y	n	
D. Guthrie _J. Sugden_ _____	Date 6/13 Start 6:30 Stop 9.30 total hrs _3___	0	0	0	n	Y	N	
D. Guthrie J. Sugden_____ _____	Date 6/25 Start 6:30 Stop 9 total hrs _2.5_	0	0	0	n	Y	N	
D. Guthrie J. Sugden__ _____	Date 7/5 start 6:45 stop 915 total hrs 2.5	0	0	0	n	Y	N	?
D. Guthrie _J. Sugden__ _____	Date 7/17 start 6:45 stop 9:15 total hrs _2.5___	0	0	0	n	Y	N	

Overall Site Summary (Total only resident WIFLs) Total survey hrs__26.0 Sugden. 13.0 guthrie 13.0	Adults	Pairs	Territories	Nests	Were any WIFLs color-banded? No If yes, report color combination(s) in the comments section on back of form
	0	0	0	0	

Name of Reporting Individual ____Dan Guthrie_____ Date Report Completed ___7/20/04_____

Submit the original of this form. Retain a copy for your records.

Fill in the following information completely. Submit original form. Retain copy for your records.

Name of Reporting Individual __Dan Guthrie_____ Phone # _909 607 2836_____

Affiliation __Claremont Colleges_____ Email dguthrie@jsd.claremont.edu_____

Site Name__Santa Clara River, Newhall Ranch, Ventura Co._____
Did you verify that this site name is consistent with that used in previous years? **Yes** No ? (circle one)
called lower Santa Clara River in previous surveys.

Management Authority for Survey Area (circle one):

Federal Municipal/County State Tribal **Private**

Name of Management Entity or Owner (e.g., Tonto National Forest) _Newhall Land Co._____

Length of area surveyed: _3 miles_____ (specify units, e.g., miles = mi, kilometers = km, meters = m)

Did you survey the same general area during each visit to this site this year? **Yes** / If no, summarize in comments below.

If site was surveyed last year, did you survey the same general area this year? **Yes** / If no, summarize in comments below.

Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):

XX Native broadleaf plants

☐ Mixed native and exotic plants (mostly native)
(entirely or almost entirely, includes high-elevation willow)

☐ Mixed native and exotic plants (mostly exotic) ☐ Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrub species: __Cottonwood, willow, tamarisk_____

Average height of canopy: __40 ft._____ (specify units)

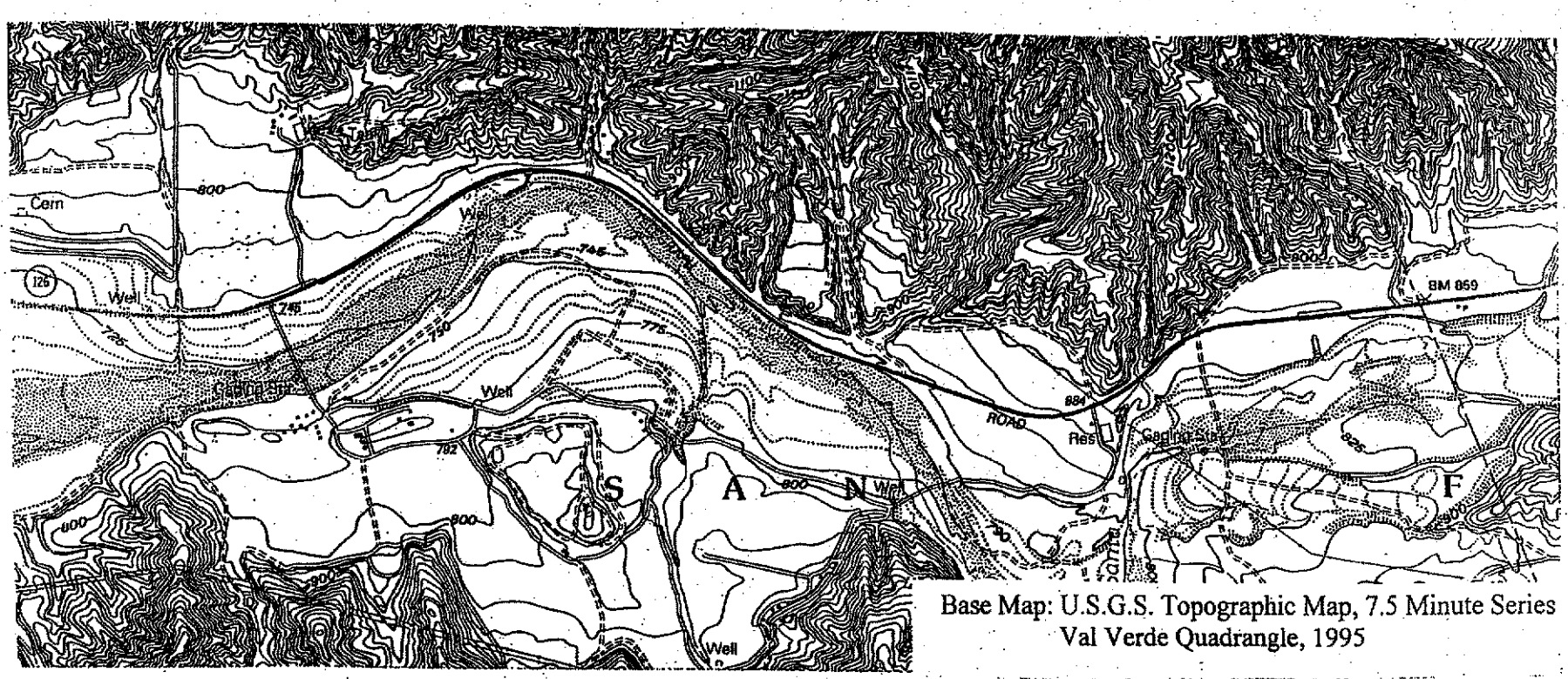
Was surface water or saturated soil present at or adjacent to site? **Yes** – river free flowing through whole section.
Distance from the site to surface water or saturated soil: _____ (specify units)

Did hydrological conditions change significantly among visits (did the site flood or dry out)? **No** (circle one)
If yes, describe in comments section below. no water present except for 50 yd section trickle in center of section.

Remember to attach a xerox copy of a USGS quad/topographical map (REQUIRED) of the survey area, noting the survey site and location of WIFL detections. You may also include a sketch or aerial photograph showing details of site location, patch shape, survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map.

Comments (attach additional sheets if necessary):_____
_____
_____two observers, each surveying approximately 1.5 miles.
_____
_____
_____
_____
_____
_____
_____
_____
_____

Figure 4. Map of area surveyed in 2004, showing location of Willow Flycatcher sighting.



Base Map: U.S.G.S. Topographic Map, 7.5 Minute Series
Val Verde Quadrangle, 1995

Bird Observations for Spring 2004 in the Proposed Potrero Valley, Long Canyon, Oak Valley and Onion Fields Development Areas, Near Valencia, California

BIRD OBSERVATIONS FOR SPRING 2004 IN THE PROPOSED POTRERO VALLEY, LONG CANYON, OAK VALLEY AND ONION FIELDS DEVELOPMENT AREAS NEAR VALENCIA, CALIFORNIA

Prepared for:

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Prepared by:

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W.M. Keck Science Center
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dguthrie@jsd.claremont.

REVISED

August 24, 2004

Bird observations for Spring, 2004 in the proposed Potrero Valley, Long Valley, Oak Valley and Onion Fields Development Areas near Valencia, California.

Prepared by: Daniel A. Guthrie
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(909) 607-2836

Nature and Scope of Surveys

During the spring of 2004 surveys were conducted within the boundaries of the proposed Potrero Valley, Long Canyon, Oak Valley and Onions Fields Projects (Figure 1). Surveys were focused on determining presence or absence of California gnatcatcher, and followed U.S. Fish and Wildlife Service Guidelines for the gnatcatcher. Numbers of all species observed were noted (Table 1), and, in addition to the species noted above, special attention was placed on locating species considered rare and endangered or of Special Concern, and on determining numbers of brown-headed cowbirds.

Each survey was conducted on foot by observers well acquainted with both visual and auditory characteristics of southern California birds. All surveys occurred between 6:30 and 10:30 a.m. If the focus species (California gnatcatcher), was not visually observed, tapes of their calls were played in an attempt to elicit a response. Survey routes were designed to visit all areas within the Proposed Project Area. However, routes for regular coverage were selected through preliminary surveys and with the aid of detailed aerial photographic vegetational maps and were designed to cover all areas of appropriate habitat for California gnatcatcher.

Personnel for all surveys were David Crawford, Guy Bruyea and Scott Cameron, working under Federal Fish and Wildlife Service Permit numbers TE-821229-4 (Crawford), TE-837439-4 (Bruyea) and and TE-808242 (Cameron), issued under section 10(a)(1)(A) of the Endangered Species Act.

Habitat Condition and Bird Observations

The project area is roughly triangular in shape, bounded on the south by a ridge between Potrero and Salt Canyons, on the northeast by a ridge along the northern side of Long Canyon, and on the northwest by the Santa Clara River. The property consists of two main valleys, Potrero Canyon to the south and the lower half of Long Canyon to the north. Both valleys are generally east –west valleys, running westward into the Santa Clara River.

Potrero Canyon is a wide, gently sloping valley. Most of the valley is an active cattle ranch and cattle were grazing throughout the study period. Native plants have been removed from most of the valley and replaced with pasture grasses. The floor of the valley was mowed in May and June. Small streambeds with a narrow band of riparian vegetation meandered down the valley but were dry during the study period. Alkaline moist soils formed marshy areas in several spots on the western end of this valley. Scattered oak trees dot the hills on the southern side of the valley and coastal sage is found on higher slopes on both sides of the valley.

The top (eastern) half of Portrero Canyon is an active oil field, and during this study there was much activity associated with closing the oil field and removing equipment and contaminated soils.

Long Valley forms a narrow canyon with steep sides. The canyon bottom supports scattered oaks and Great Basin sage while the canyon sides are covered with dense chaparral with sections of coastal sage vegetation. The mouth of the canyon and the hilltop between the mouth of this canyon and Potrero Canyon are actively farmed and were under cultivation during the survey. Long Valley was also an active oil field, and oil activity was being curtailed during this study, involving removal of oil equipment and contaminated soil. Access to Potrero Valley, Long Valley, and the ridges between these two valleys and along the north side of Long Valley was greatly facilitated by a network of oil field roads.

A third section of the site, named Onion Fields, consists of active agricultural fields at the mouth of Long Canyon. A riparian woodland along the Santa Clara River and adjacent to these fields is a nesting site for least Bell's vireo. This area was not included in these surveys but has been regularly censused as part of studies along the Santa Clara River.

Observations of all birds are shown in Table 1. The numbers shown are of birds seen and heard, with heard individuals forming the majority of the observations. Numbers vary between censuses for several reasons. Some censuses were not complete but, rather, were focused on particular places or areas. Also, bird activity varies with season. Different species breed at different times of the year. In general, species are most easily observed when they are actively defending territories by song during the establishment of breeding pairs. Once pairs are established and nesting begins song often decreases and the numbers of birds observed, therefore, also decreases. After young leave the nest, numbers observed increase. Thus, for most resident species, numbers of adult birds are most accurately censused in April and May, when territorial activity is at a maximum. A few species such as Anna's hummingbird that nest early in the season may be underestimated. Many species that nest in the area also migrate through the area to more northern portions of their ranges. Thus, numbers of nesting species observed in May, which include migratory birds passing through the area, do not give an accurate count of actual resident birds.

The avifauna of Potrero Canyon consists of species common to grasslands, such as western meadowlark, lark Sparrow, red-winged blackbird and kingbirds. Swallows nesting on cliffs along the Santa Clara River were frequently observed foraging over the area. In

the oak trees acorn woodpecker and oak titmouse are found while in the areas of coastal sage California quail, Bewick's wren, lazuli bunting, California towhee, California thrasher and rufous-crowned sparrow are the common species. House finch, orioles and phainopepla were common in elderberry and tree tobacco along the valley floor.

The avifauna of Long Canyon consists mostly chaparral and coastal sage species on the canyon sides and oak woodland species along the canyon bottom. The irrigated agricultural fields at the mouth of Long Canyon attract ravens and a few riparian species from the adjacent Santa Clara River such as blue grosbeak and yellowthroat. Cliffs along the Santa Clara River and an isolated canyon extending up from the Santa Clara River between Long and Potrero Canyon provided nesting places for ravens, swallows and probably owls.

Comments on Threatened and Endangered Species

California Gnatcatcher *(Polioptila californica)*

The California Gnatcatcher is listed as a Threatened species under the Federal Endangered Species Act. Survey routes were selected to cover prime habitat for California Gnatcatcher, namely, stands of dense Coastal Sage Scrub. Surveys followed the protocol for non-NCCP areas, involving 6 surveys of each area, occurring between March 15 and June 30 (see Table 1 for exact dates). Because of the size of the area of sage scrub vegetation, two sets of surveys were completed, one primarily in Long Canyon and one primarily in Potrer and Oak Valley areas. Each survey involved two observers and lasted about 4 hours (6 to 10 am), with each observer covering an area containing about 80 acres of suitable habitat. Although all areas of coastal sage scrub habitat were surveyed, particular attention was placed on more open scrub areas with a slope of less than 40% and dominated by California sage as this type of vegetation has been shown to be preferred by gnatcatchers (Federal Register, 2003). Tapes of California gnatcatcher calls were played at regular intervals along all survey routes. No California gnatcatchers were heard or observed during this study.

Comments on Sensitive Species

Great Blue Heron *(Ardea herodias)*

Great Blue Herons are listed on the California Natural Diversity Data Base as a species that warrants monitoring. Individuals of this species are observed sparingly along the Santa Clara River before and after breeding season and occasionally visit agricultural fields and grasslands in the project area to hunt for mice and toads.

White-tailed Kite (*Elanus leucurus*)

This species, formerly the black-shouldered kite, is considered a Species of Special Concern by the State of California. Kites nest in the riparian forest along the Santa Clara River and a pair were observed once hunting over the grassy sections of this area.

Cooper's Hawk (*Accipiter cooperi*)

Cooper's hawk is considered a Species of Special Concern by the State of California. Cooper's hawks nest in woodlands along the Santa Clara River immediately north of the study area. Cooper's hawk were regularly observed hunting in the wooded areas of the project.

Southern California Rufous-crowned Sparrow (*Almophila ruficeps canescens*)

This species is considered a California Special Concern species by the Department of Fish and Game and a Species of Concern by the Fish and Wildlife Service. Rufous-crowned sparrows are a fairly common resident and breeding species in denser sections of sage scrub habitat throughout the study site.

Lawrence's Goldfinch *(Carduelis canescens)*

This species is a highest priority species on the Audubon Birds to Watch list for 1996 and listed as a Bird of Management Concern by the Fish and Wildlife Service. This species was observed rarely in coastal sage areas.

Summary

No California gnatcatcher were observed during this study. Species of Concern on the site include the coastal sage species Southern California rufous-crowned sparrow and Lawrence's goldfinch, both of which may nest. Three other Species of Concern, great blue heron, Cooper's hawk and white-tailed kite were observed hunting on the site. The two latter species probably nest in riparian woodland along the Santa Clara River just north of the study area while the great blue heron is a migrant through the area.

References

Federal Register, 2003. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*) and Determination of Distinct Vertebrate Population for the California Gnatcatcher *Polioptila californica). Vol 68, no 79 April 24, 2003, p. 20228.*

Table 1. Observations of Birds in Potrero Valley, Oak Valley, Onion fields and Long Canyon, 2004:

Endangered Species and Species of Concern Shaded

		Dates of Surveys											
SPECIES	**STAT.**	**3/16**	**3/20**	**3/27**	**4/3**	**4/10**	**4/17**	**4/24**	**5/1**	**5/8**	**5/15**	**5/22**	**5/29**
Great Blue Heron	m,w	1	0	0	0	0	1	0	0	0	0	0	0
Turkey Vulture	s	3	1	3	1	0	3	2	1	2	5	2	3
White-tailed Kite	r	0	0	0	0	0	0	0	0	0	0	2	0
Cooper's Hawk	r	0	1	2	1	2	2	1	0	0	0	0	0
Red-tailed Hawk	r	1	3	1	1	2	2	1	1	2	2	1	4
American Kestrel	r	1	0	0	1	1	0	0	0	1	0	1	0
California Quail	r	18	24	30+	18	24	30+	30+	30+	30+	30+	30+	30+
Killdeer	r	0	0	0	0	0	0	0	0	2	0	1	0
Rock Dove	r	6	2	5	5	2	14	2	5	0	5	12	8
Mourning Dove	r	2	9	4	3	9	8	6	6	8	5	4	8
Greater Roadrunner	r	0	0	0	0	1	2	0	0	1	1	1	2
Barn Owl	r	0	0	1	0	0	0	1	0	0	0	0	0
White-th. Swift	r	0	0	0	0	0	0	0	0	0	0	2	0
Black-chin. Hummingbird	s	0	0	1	0	0	0	0	0	0	0	0	0
Anna's Hummingbird	r	6	11	10	5	4	5	6	4	5	8	6	11
Costa's Hummingbird	s	0	1	0	0	0	2	1	1	0	0	0	0
Rufous Hummingbird	m	0	0	1	0	0	0	0	0	0	0	0	0
Acorn Woodpecker	r	3	3	6	0	0	1	0	0	3	1	3	3
Northern Flicker	r	0	2	1	0	0	0	1	0	1	0	1	0
Black Phoebe	r	0	3	0	0	1	2	2	1	0	2	1	3
Cassin's Kingbird	s	0	0	0	0	0	1	0	0	0	0	0	0
Western Kingbird	s	0	0	8	3	4	6	5	2	7	1	5	9
Western Scrub Jay	r	17	9	11	9	12	18	15	10	14	13	10	17
American Crow	r	12	8	9	4	0	3	10	6	9	8	10	13
Common Raven	r	4	2	0	2	1	2	2	1	1	2	2	2
Violet-green Swallow	s	0	0	0	0	5	2	0	0	0	0	1	0
N. Rough-winged Swallow	s	0	0	0	0	0	5	4	5	2	5	8	6
Cliff Swallow	s	0	0	0	2	4	2	6	2	6	6	5	7
Barn Swallow	s	0	0	0	0	0	3	0	0	0	0	0	0
Oak Titmouse	r	0	0	2	0	2	0	0	0	0	0	0	0
Bushtit	r	9	16	7	8	2	11	8	8	2	0	0	4
Bewick's Wren	r	19	21	26	9	20	7	11	4	11	7	15	18
House Wren	r	1	0	3	1	0	0	1	1	0	0	1	0
Blue-gray Gnatcatcher	r	0	2	6	0	0	0	0	0	0	0	0	0
Western Bluebird	r	0	2	3	0	0	1	2	2	2	0	1	0
Wrentit	r	7	14	13	11	8	6	10	3	8	6	10	14
Northern Mockingbird	r	0	4	5	0	2	2	3	3	4	5	3	5
California Thrasher	r	5	2	5	5	2	8	3	2	5	1	4	6
European Starling	r	8	26	14	8	6	9	4	8	11	3	5	4
Phainopepla	r	0	0	0	0	0	0	0	0	2	3	6	8

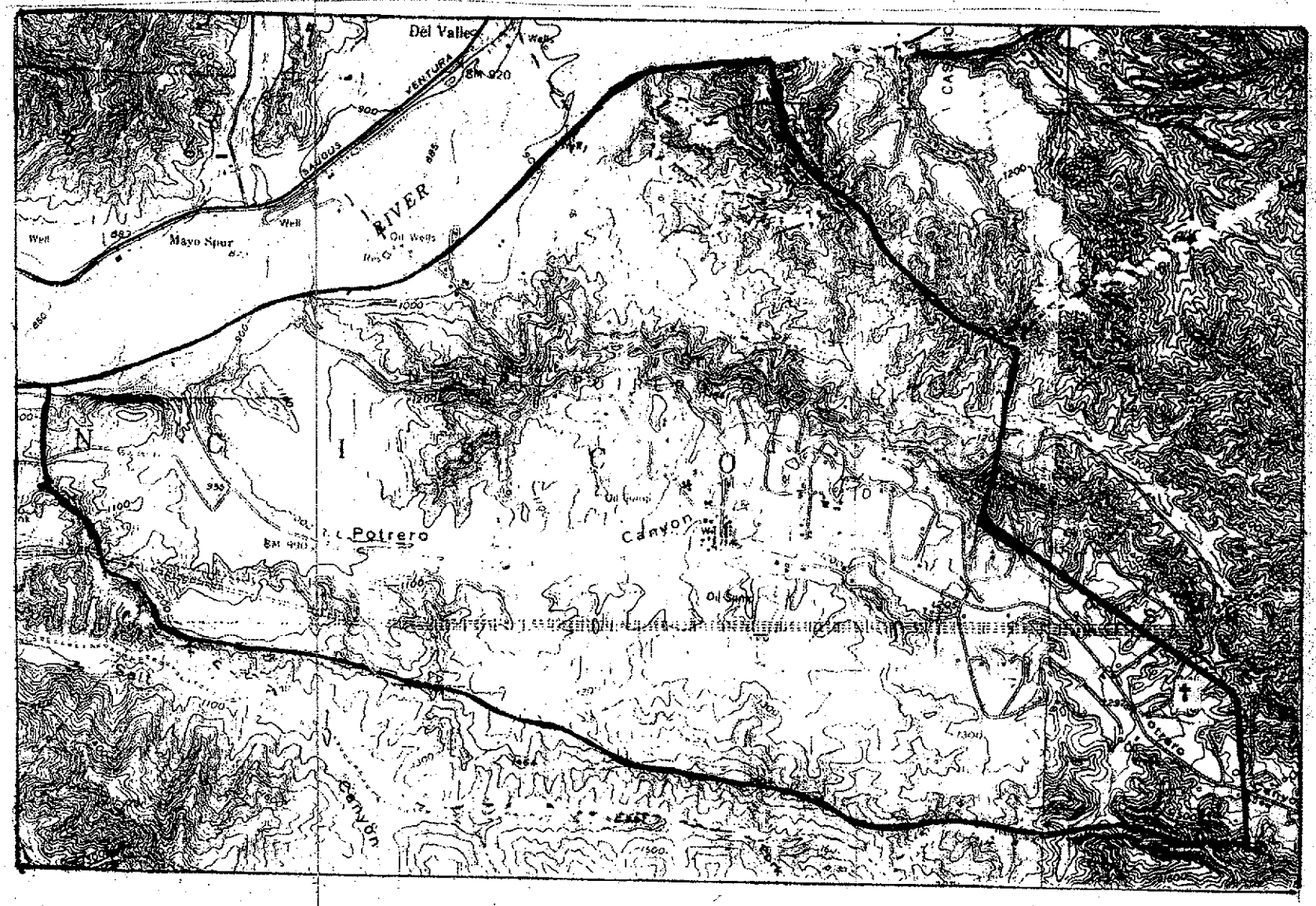
Table 1 (cont.). Observations of Birds in Potrero Valley, Oak Valley, Onion fields and Long Canyon, 2004

Endangered Species and Species of Concern Shaded

		Dates of Surveys											
SPECIES	**STATU**	**3/16**	**3/20**	**3/27**	**4/3**	**4/10**	**4/17**	**4/24**	**5/1**	**5/8**	**5/15**	**5/22**	**5/29**
Yellow-rumped Warbler	w,m	2	0	1	0	0	0	0	0	0	0	0	0
Spotted Towhee	r	30+	30+	30+	30+	30+	30+	30+	30+	30+	30+	30+	30+
California Towhee	r	30+	30+	30+	30+	30+	30+	30+	30+	30+	30+	30+	30+
Rufous-crowned Sparrow	r	0	2	4	0	1	3	2	1	1	0	0	0
Lark Sparrow	r	0	0	0	0	2	0	0	0	2	0	0	0
Savannah Sparrow	r	0	0	0	0	0	0	0	2	0	4	0	6
Fox Sparrow	w,m	0	0	4	0	0	0	0	0	0	0	0	0
Song Sparrow	r	0	0	0	0	0	0	0	2	0	0	1	2
White-crowned Sparrow	w,m	6	11	4	4	10	4	6	0	0	0	0	0
Black-headed Grosbeak	s	0	0	0	0	1	0	0	3	0	2	0	0
Blue Grosbeak	s	0	0	0	0	0	0	0	0	0	3	0	1
Lazuli Bunting	s	0	0	0	0	0	0	0	0	0	2	0	0
Red-winged Blackbird	s	0	0	0	0	5	18	12	9	19	10	12	12
Western Meadowlark	r	0	0	0	0	5	1	3	0	2	3	5	4
Brewer's Blackbird	r	8	0	0	0	4	0	0	0	0	0	6	3
Bullock's Oriole	s	0	0	0	1	5	2	3	3	3	5	4	8
House Finch	r	2	9	13	4	4	10	13	9	14	12	13	22
Lesser Goldfinch	r	0	2	0	0	0	1	4	4	5	1	3	11
Lawrence's Goldfinch	r	0	0	0	0	1	0	0	0	0	0	0	0

Status: m, migrant; r, resident; s, summer only; w, winter

Figure 1. Outline of areas surveyed for the proposed Potrero Valley, Long Canyon, Oak Valley and Onion Fields Development.



Base Map: U.S.G.S. 7.5 minute topographic map for Newhall, 1952 and Val Verde, 1968, California, both photorevised 1988.

Bird Observations in the Proposed Homestead and Chiquito Areas, Near Valencia, California, 2004

BIRD OBSERVATIONS IN THE PROPOSED HOMESTEAD AND CHIQUITO AREAS, NEAR VALENCIA, CALIFORNIA, 2004

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Bird Observations in the Proposed Homestead, Chiquito and River Village Project Areas near Valencia, California, 2004

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Nature and Scope of Surveys

During the spring of 2004 surveys were conducted within the boundaries of the proposed Homestead, Chiquito and River Village Project areas (Figure 1). Surveys were focused on determining presence or absence of California gnatcatcher, and followed U.S. Fish and Wildlife Service Guidelines for this species. Surveys followed the protocol for non-NCCP areas, involving 6 surveys of each area, occurring between March 15 and June 30 (see Table 1 for exact dates). Each survey involved two observers and lasted up to 4 hours (6:30 to 10:30 a.m.), with each observer covering an area less than 80 acres of suitable habitat.

Each survey was conducted on foot by observers well acquainted with both visual and auditory characteristics of southern California birds. Tapes of calls of California gnatcatcher were played periodically along survey routes in an attempt to elicit a response. Survey routes were designed to visit all areas within the Proposed Project Area. However, routes for regular coverage were selected through preliminary surveys and were designed to cover all areas of appropriate habitat for the focus species. Personnel for all surveys were David Crawford, Guy Bruyea and Scott Cameron, working under Federal Fish and Wildlife Service Permit numbers TE-821229-4 (Crawford), TE-837439-4 (Bruyea) and TE-808242 (Cameron), issued under section 10(a)(1)(A) of the Endangered Species Act.

On each survey, numbers of all species observed were noted and, in addition to the gnatcatcher, special attention was placed on locating species considered rare and endangered or of Special Concern, and on determining numbers of raptoral birds. Table 1 presents all observations during these surveys.

Habitat Condition and Bird Observations.

Much of the Homestead Project Area (Figure 1) was burned in 2003 with the result that the area was covered primarily with grasses. However, some sections of sage scrub habitat remained unburned along the sides of San Martinez Grande Canyon Rd. The River Village Project area consists almost entirely of agricultural fields under cultivation and were not surveyed. The Chiquito Project Area was unburned and covered with sage scrub vegetation. Surveys were focused on the sections of sage scrub vegetation with a slope of less than 40% in the Chiquito Project area and along San Martinez Grande Canyon Rd.

Observations of all birds are shown in Table 1. The numbers shown are of birds seen and heard, with heard individuals forming the majority of the observations. Numbers vary between censuses for several reasons. Some censuses were not complete but, rather, were focused on particular places or areas. Also, bird activity varies with season. Different species breed at different times of the year. In general, species are most easily observed when they are actively defending territories by song during the establishment of breeding pairs. Once pairs are established and nesting begins song often decreases and the numbers of birds observed, therefore, also decreases. After young leave the nest, numbers observed increase. Thus, for most resident species, numbers of adult birds are most accurately censused in April and May, when territorial activity is at a maximum. A few species such as Anna's hummingbird that nest early in the season may be underestimated. Many species that nest in the area also migrate through the area to more northern portions of their ranges. Thus, numbers of nesting species observed in May, which include migratory birds passing through the area, do not give an accurate count of actual resident birds.

Comments on Threatened and Endangered Species

California Gnatcatcher (*Polioptila californica*)

The California Gnatcatcher was listed as a Threatened species under the Federal Endangered Species Act in 1993. Preferred habitat includes various sage scrub communities, often dominated by California sage (*Artemesia californica*) and buckwheat (*Eriogonum sp.*) California gnatcatchers generally avoid nesting in areas with a slope of greater that 40%. Although the area surveyed here is outside the Designated Critical Habitat for the California gnatcatcher, it is near to areas designated as critical habitat on the south side of route 126. (Federal Register, 2003)

Survey routes were selected to cover prime habitat for California Gnatcatcher, namely, stands of dense Sage Scrub in canyon bottoms and on north facing hillsides with slopes of less than 40%. No California gnatcatchers were heard or observed during our surveys.

Comments on Sensitive Species

Loggerhead Shrike (*Lanius ludovicianus*)

This is a California Species of Special Concern. A single shrike was observed on April 6th.

Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*)

This species is considered a California Special Concern species by the Department of Fish and Game and a Species of Concern by the Fish and Wildlife Service. Rufous-crowned sparrows are a fairly common resident and breeding species in sage scrub habitat and were observed as uncommon residents in the study area.

Summary

California gnatcatchers were not observed on the site. Birds of the site are those typical of dry sage scrub habitat and two of the observed species. loggerhead shrike and Southern California rufous-crowned sparrow, are considered Species of Concern.

References

Federal Register, 2003. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*) and Determination of Distinct Vertebrate Population for the California Gnatcatcher *Polioptila californica). Vol 68, no 79 April 24, 2003, p. 20228.*

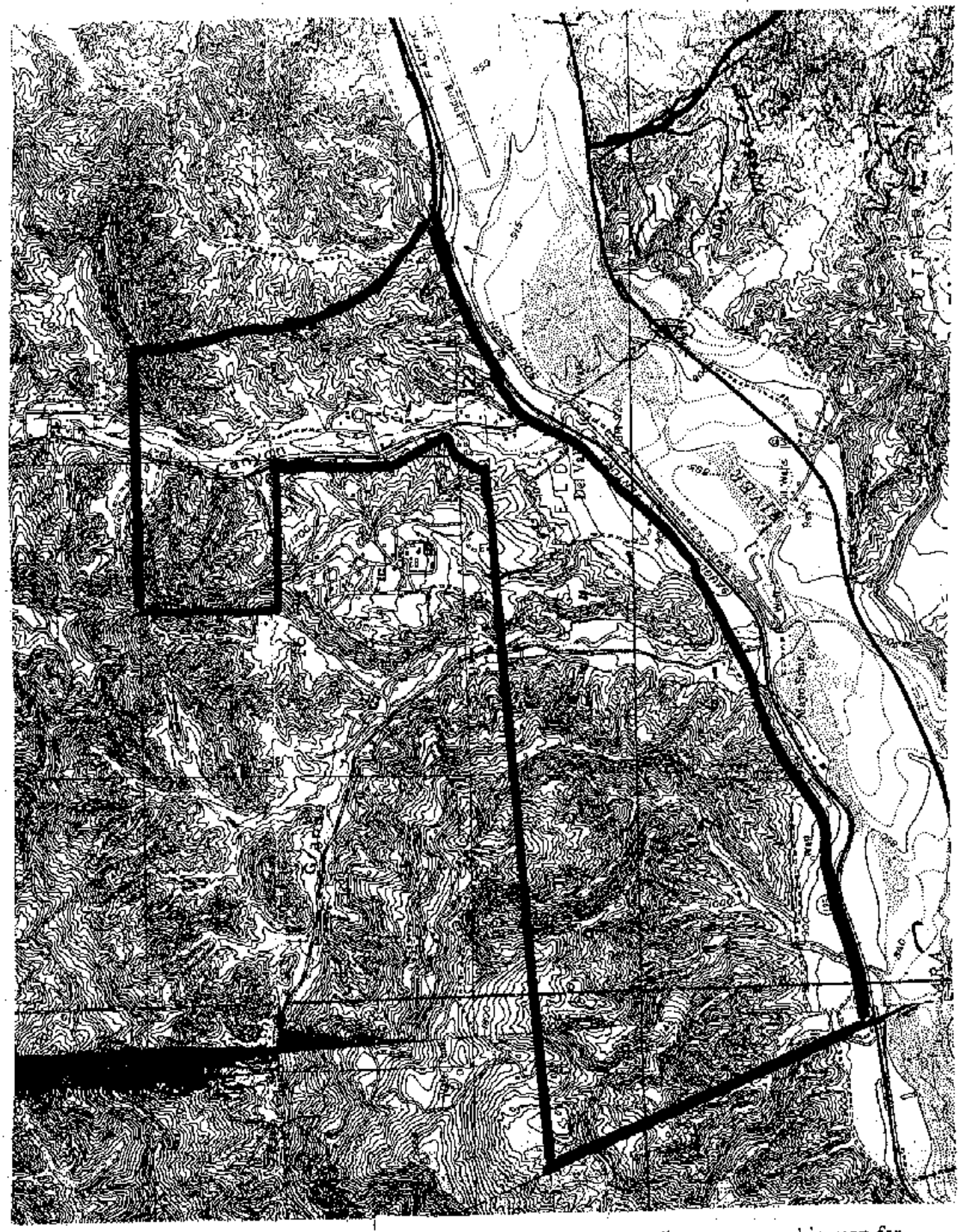
Table 1. Bird Observations on the Homestead and Chiquito Areas, 2004:

Endangered Species and Species of Concern Shaded

		Dates of Surveys					
SPECIES	**STATUS**	**3/23**	**4/6**	**4/20**	**5/11**	**5/25**	**6/2**
Turkey Vulture	s	2	4	3	1	0	2
Red-tailed Hawk	r	2	2	2	1	1	1
California Quail	r	30+	30+	17	30+	17	30+
Western Gull	m	8	15	2	10	4	18
Rock Dove	r	0	8	4	0	4	5
Mourning Dove	r	11	6	3	3	3	5
Greater Roadrunner	r	1	1	0	1	0	0
Anna's Hummingbird	r	4	4	3	2	3	5
Costa's Hummingbird	s	0	0	1	0	0	0
Acorn Woodpecker	r	1	0	0	0	0	0
Black Phoebe	r	1	0	0	0	0	0
Say's Phoebe	r	0	1	0	0	0	0
Western Kingbird	s	6	5	3	4	3	0
Loggerhead Shrike	r	0	1	0	0	0	0
Western Scrub Jay	r	21	7	7	7	7	8
American Crow	r	9	5	4	5	4	4
Common Raven	r	3	4	2	4	2	1
N. Rough-winged Swallow	s	0	2	0	3	0	9
Cliff Swallow	s	0	0	3	0	3	4
Bushtit	r	12	9	4	9	4	6
Bewick's Wren	r	12	9	8	9	8	11
Wrentit	r	17	4	6	4	6	9
Northern Mockingbird	r	5	6	1	6	3	4
California Thrasher	r	8	2	6	1	2	2
European Starling	r	0	6	0	0	0	2
Yellow-rumped Warbler	w,m	0	3	0	0	0	0
Common Yellowthroat	r	1	0	0	0	0	0
Spotted Towhee	r	30+	11	9	10	9	14
California Towhee	r	30+	23	16	23	16	22
Rufous-crowned Sparrow	r	0	0	0	0	0	0
Chipping Sparrow	w,m	1	0	0	0	0	0
Lark Sparrow	r	17	0	0	0	0	0
Savannah Sparrow	r	3	2	0	2	0	0
Fox Sparrow	w,m	2	0	0	0	0	0
Song Sparrow	r	2	0	0	0	0	0
White-crowned Sparrow	w,m	26	17	2	6	2	0
Black-headed Grosbeak	s	0	0	1	1	0	0
Western Meadowlark	r	1	2	0	2	0	1
Brewer's Blackbird	r	0	3	0	3	0	0
House Finch	r	4	4	8	4	8	12
Lesser Goldfinch	r	0	2	3	2	3	6

Status: m, migrant; r, resident; s, summer only; w, winter

Figure 1. Boundaries of Homestead and Chiquito Projects.



Base Map: U.S.G.S. 7.5 Minute topographic map for Val Verde, California, 1952, photorevised 1969

Bird Observations During 2004 at Castaic Junction, an Area on the North Side of the Santa Clara River at the Junction of State Route 126 and Interstate 5

BIRD OBSERVATIONS DURING 2004 AT CASTAIC JUNCTION, AN AREA ON THE NORTH SIDE OF THE SANTA CLARA RIVER AT THE JUNCTION OF STATE ROUTE 126 AND INTERSTATE 5. NEAR VALENCIA, CALIFORNIA

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August 24, 2004

Bird Observations during 2004 at Castaic Junction, an area on the north side of the Santa Clara River at the Junction of State Route 126 and Interstate 5, near Valencia, California

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Nature and Scope of Surveys

During the spring and early summer of 2004 bird surveys were conducted on the north side of the Santa Clara River at Castaic Junction. The surveys covered an area roughly triangular in shape and bounded on the northeast by Interstate 5, on the northwest by State Route 126 and on the southern edge by the Santa Clara River (Figure 1).

Surveys were focused on determining presence or absence of California gnatcatcher, and followed U.S. Fish and Wildlife Service protocol for this species in non-NCCP areas. This protocol requires 6 surveys between March 15 and June 30 (see Table 1 for exact dates). Each survey involved one observer and lasted about 1 hour (9 to 10 am), and covered no more than 40 acres of suitable habitat

Each survey was conducted on foot by observers well acquainted with both visual and auditory characteristics of southern California birds. Tapes of calls of California gnatcatcher were played periodically along survey routes in an attempt to elicit a response. Survey routes were designed to visit all areas within the Proposed Project Area. However, routes for regular coverage were selected through preliminary surveys and were designed to cover all areas of appropriate habitat for the focus species. All surveys were conducted by Daniel A. Guthrie, working under Federal Fish and Wildlife Service Permit number TE810394-2, issued under section 10(a)(1)(A) of the Endangered Species Act.

On each survey, numbers of all species observed were noted and, in addition to the gnatcatcher, special attention was placed on locating species considered rare and endangered or of Special Concern, and on determining numbers of raptoral birds. Table 1 presents all observations during these surveys.

Habitat Condition and Bird Observations.

Over 80 % of the study area consists of agricultural fields. When crops were present, these fields were irrigated and attracted a few birds from adjacent riparian areas. During periods after plowing, blackbirds and killdeer were found foraging on the bare dirt areas.

A series of flowering eucalyptus trees along the frontage road in the area were attractive to starlings, orioles and wintering and migrating warblers. A pair of kestrels nested in one of these trees and red-shouldered hawk often hunted over uncultivated sections of the area.

A ditch containing irrigation and urban runoff (Figure 1) entered the site from the east and formed the southern border of the agricultural field. This ditch, containing cattails, was the only place within the study site where wet riparian species successfully nested, namely black phoebe, song sparrow and common yellowthroat.

The southwestern side of the study area bordered the Santa Clara River, with little or no transitional zone between the agricultural field area and the riparian river channel. Along most of this edge the river had cut into the bank, resulting in a cliff up to 15 feet high with agricultural field at the top and riparian vegetation directly below. In order to prevent further erosion of the river bank in this section, a new channel for the river was created by bulldozing in the spring of 1998. This new channel has moved the active river channel away from the field and road edge and has created a zone of low lying land along the north side of the riparian zone that is protected from erosion and scouring by spring floods. This protected section is wet from seepage from the main channel and from agricultural and urban runoff, with the result that a dense stand of willows has developed along the north edge of the riparian zone. These willows are now six years old and are prime habitat for both willow flycatchers and least Bell's vireo. This proximity of excellent riparian habitat to the agricultural area, and the need for any development of the lands adjacent to the river to encroach into the riparian area while stabilizing this bank are the reasons why some species from the riparian area immediately adjacent to the agricultural fields are mentioned in this report.

Observations of all birds are shown in Table 1. The numbers shown are of birds seen and heard, with heard individuals forming the majority of the observations. Numbers vary between censuses for several reasons. First, there was fog on some censuses which decreased bird activity. Secondly, some censuses were not complete but, rather, were focused on particular places or areas. Thirdly, bird activity varies with season. Different species breed at different times of the year. In general, species are most easily observed when they are actively defending territories by song during the establishment of breeding pairs. Once pairs are established and nesting begins song often decreases and the numbers of birds observed, therefore, also decreases. After young leave the nest, numbers observed increase. Thus, for most resident species, numbers of adult birds are most accurately censused in April and May, when territorial activity is at a maximum. A few species such as Anna's hummingbird that nest early in the season may be underestimated. Many species that nest in the area also migrate through the area to more northern portions of their ranges. Thus, numbers of nesting

species observed in May, which include migratory birds passing through the area, do not give an accurate count of actual resident birds.

Comments on Threatened and Endangered Species

California Gnatcatcher (*Polioptila californica*)

Lack of any coastal sage scrub vegetation in the study area make it an unsuitable habitat for this species, and none were observed.

Least Bell's Vireo (*Vireo bellii pusillus*)

Although no least Bell's vireos were found on the study site, this species was heard and seen at two locations in the riparian zone immediately south of the study area where they nested (Figure 1). One of these nesting sites is immediately adjacent to the agricultural field.

Summary of Bird Sightings

No California gnatcatchers or any other Endangered or Threatened Species or Species of Concern was observed in the survey area. Least Bell's vireo nested in the riparian habitat adjacent to the site, and several other species of concern (yellow warbler, yellow-breasted chat) were also present in this riparian section. These species might be affected by construction activities along this riparian edge if these were to occur during the nesting season for these species.

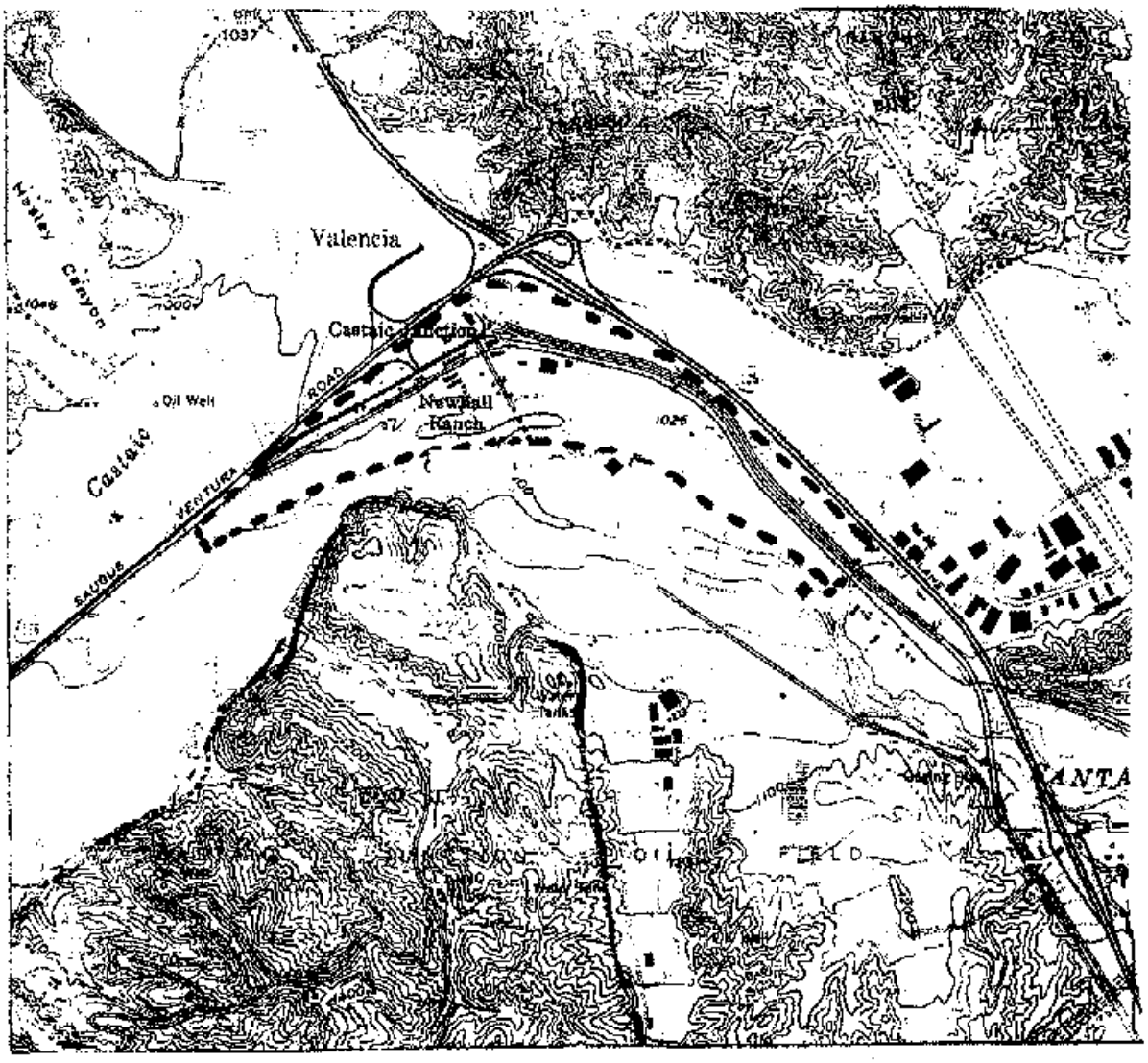
Table 1. Bird Observations at Castaic Corner, 2004:

Endangered Species and Species of Concern Shaded

SPECIES	STATUS	Dates of Surveys					
		4/27	5/18	5/27	6/9	6/15	6/23
Turkey Vulture	s	1	0	0	0	0	0
Red-shouldered Hawk	r	1	1	0	0	0	1
American Kestrel	r	0	0	0	0	1	1
California Quail	r	4	0	2	4	0	0
Killdeer	r	0	0	1	0	2	0
Rock Dove	r	2	0	0	0	0	0
Mourning Dove	r	0	0	4	3	5	2
Black Phoebe	r	1	2	2	0	0	1
Ash-throated Flycatcher	s	1	1	1	0	2	0
Western Scrub Jay	r	5	2	0	0	1	0
American Crow	r	1	0	4	0	8	8
Common Raven	r	1	0	2	4	8	4
N. Rough-winged Swallow	s	4	3	0	0	0	2
Cliff Swallow	s	0	0	3	30	0	0
Barn Swallow	s	0	1	0	1	0	0
Bewick's Wren	r	2	0	0	0	1	0
House Wren	r	2	0	0	0	0	0
Western Bluebird	r	0	0	0	2	0	0
American Robin	r	0	0	0	2	0	0
California Thrasher	r	0	0	0	0	1	0
European Starling	r	6	0	1	2	0	4
Common Yellowthroat	r	0	0	1	0	0	0
Spotted Towhee	r	0	0	2	0	0	2
California Towhee	r	4	0	4	4	3	2
Song Sparrow	r	2	2	4	4	0	2
Black-headed Grosbeak	s	0	1	1	2	1	0
Blue Grosbeak	s	0	3	0	0	0	1
Red-winged Blackbird	s	2	10	18	9	8	6
Brewer's Blackbird	r	0	1	0	0	0	0
Hooded Oriole	s	0	0	0	0	0	1
Bullock's Oriole	s	0	0	2	0	0	0
House Finch	r	16	15	13	10	9	36
Lesser Goldfinch	r	0	2	0	0	0	0
American Goldfinch	w,m,r	0	0	0	0	0	1
House Sparrow	r	2	0	8	0	0	10

Status: m, migrant; r, resident; s, summer only; w, winter

Figure 1. Survey area with indication of location of least Bell's vireo nesting.



- - - - Approximate boundary of survey area.

◆ - Least Bell's vireo nest site.

Base Map: U.S.G.S. 7.5 minute topographic map for Newhall, California, 1952, photorevised 1988

Bird Surveys Along a Portion of the Santa Clara River and Its Tributaries Upstream from the Castaic Creek Confluence, Near Valencia, California, 2004

BIRD SURVEYS ALONG A PORTION OF THE SANTA CLARA RIVER AND ITS TRIBUTARIES UPSTREAM FROM THE CASTAIC CREEK CONFLUENCE, NEAR VALENCIA, CALIFORNIA, 2004

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August 24, 2004

REVISED

Bird Surveys along a Portion of the Santa Clara River Upstream from the Castaic Creek Confluence, near Valencia, California, 2004

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Nature and Scope of Surveys

During the spring and early summer of 2004 surveys were conducted along a section of the Santa Clara River and its tributaries near Valencia, California (Figure 1). Surveys were focused on determining presence or absence of yellow-billed cuckoo, least Bell's vireo and southwestern willow flycatcher, and followed U.S. Fish and Wildlife Service Survey Protocols for the latter two species. Numbers of all species observed were noted, and, in addition to the three species noted above, special attention was placed on locating species considered rare and endangered or of Special Concern, and on determining numbers of brown-headed cowbirds.

Each survey was conducted on foot by observers well acquainted with visual, auditory and behavioral characteristics of southern California birds. Survey routes were designed to cover all areas of each section of the river, with emphasis placed on wetter habitats where least Bell's vireos and other sensitive riparian species are most likely to occur. All surveys occurred between 6:00 and 10:00 a.m. If focus species (yellow-billed cuckoo, least Bell's vireo, and southwestern willow flycatcher), were not visually observed, tapes of their calls were played in an attempt to elicit a response. Personnel for all surveys were Daniel A. Guthrie and Judith A. Sugden, both working under Federal Fish and Wildlife Service Permit number TE810394-2, issued under section 10(a)(1)(A) of the Endangered Species Act and under an MOU from State of California Department of Fish and Game, dated April 23, 2003.

To facilitate surveys and observe the coverage guidelines for focus species, the area was divided into eight sections (Figure 1). Delineation of the eight areas and comments on each follow. Surveys of all sections of the river system were conducted five times during the nesting season and followed the Revised Protocol (Fish And Wildlife Service, July 2000) for southwestern willow flycatcher. Several sections of the river (Areas 4, 6-8) had no running water or wet riparian vegetation and were not considered suitable habitat for least Bell's vireo. However, areas 1-3,5 had flowing water and wet riparian vegetation. These sections were surveyed according to the protocol for least Bell's vireo as outlined by the Fish and Wildlife Service. This latter protocol requires 8 surveys between April 10 and July 31st, at least 10 days apart.

Habitat Condition and Bird Observations.

The riparian zone of the Santa Clara River, as described here, consists of two major habitat types, a wet riparian zone and a dry riparian woodland. The wet riparian zone consists of obligatory wet plants such as cattail and watercress found in continually moist soils along the active river channel and some willow, tamarisk and *Baccharis* shrubs also found in this zone. This zone undergoes regular scouring in the winter which removes most annual vegetation and, depending on the severity of the flooding, some of the larger plants. These plants gradually repopulate the riparian zone, becoming completely established by July.

The dry riparian zone consists of larger trees and shrubs further back from the active river which obtain moisture through their deep root system. During 2004 rainfall was minimal with the result that in this zone annual plants were found only in a few areas that received runoff from nearby suburbs and agricultural fields.

Observations of all birds are shown in Tables 1-8. The numbers shown are of birds seen and heard, with heard individuals forming the majority of the observations. Numbers vary between censuses. Bird activity varies with season. Different species breed at different times of the year. In general, species are most easily observed when they are actively defending territories by song during the establishment of breeding pairs. Once pairs are established and nesting begins song often decreases and the numbers of birds observed, therefore, also decreases. After young leave the nest, numbers observed may increase. Thus, for most resident species, numbers of adult birds are most accurately censused in April and May, when territorial activity is at a maximum. A few species such as Anna's hummingbird that nest early in the season may be underestimated. Many species that nest in the area also migrate through the area to more northern portions of their ranges. Thus, numbers of nesting species observed in May, which include migratory birds passing through the area, do not give an accurate count of actual resident birds.

Area 1 (Table 1). Santa Clara River; The Old Road Bridge to the mouth of Castaic Creek.

Length of section, 3.5 miles. The Santa Clara River flows continuously in this section, receiving most of its flow from the Valencia waste water outfall near the upstream end of this section and from some irrigation runoff from Magic Mountain and agricultural fields along the north side.

Along the upper portion of this section, wet riparian vegetation forms a narrow strip along the main channel of the Santa Clara River. This section was little damaged by spring flooding. The extensive willow riparian zone near Magic Mountain and along the agricultural fields north of the river also was not damaged. Scouring did occur further downstream towards the mouth of Castaic Creek. Least Bell's vireos nested near Castaic Junction and white-tailed kite nested in the dry woodlands towards the mouth of Castaic Creek.

Area 2 (Table 2). Santa Clara River; McBean Parkway downstream to The Old Road.

Length of section, 1.4 miles. Although the Santa Clara River has flowed continuously in this section in past years, in 2004 flow was very low. There was no flow from McBean Parkway west to the pipeline crossing where seepage within the stream channel began a small flow. This flow stopped at the railroad crossing. Seeps near Interstate 5 provided flow between Interstate 5 and The Old Road. Lack of water resulted in their being little wet riparian vegetation during most of the survey period. The wet willow forest near the mouth of San Francisquito Creek was carefully surveyed for focus species as migrating willow flycatcher have been seen here in previous years. None were found this year.

Area 3 (Table 3). Santa Clara River; Bouquet Canyon Road downstream to McBean Parkway

Length of section, 1.2 miles. Water, supplied by the Saugus wastewater outfall at the Bouquet Canyon Bridge usually flows the length of this section but this year the western half of this section was dry. This resulted in a reduction in birds that prefer wet riparian vegetation, such as song sparrow and yellowthroat.

Area 4 (Table 4). Santa Clara River; Bouquet Canyon Road upstream to DWP transmission lines.

Length of section, 2.3 miles. The river channel in this section consists of a broad, flat, dry wash with narrow margins of dry riparian woodland. Within the channel are areas of coastal sage scrub habitat. This section of the Santa Clara River in past years has been wet only briefly during spring rains and due to water release from pumps one mile upstream from Bouquet Canyon Road. This section was completely dry during all surveys this year. This resulted in the almost complete absence of riparian species such as song sparrow and yellowthroat.

Rufous-crowned sparrow and loggerhead shrike, resident on hillsides along the river, were observed visiting the stream channel. Aside from migrants, most of the other birds observed in this section are characteristic of coastal sage and dry riparian woodlands.

Area 5 (Table 5). Castaic Creek; Route 126 to Interstate 5.

Length of section, 1.8 miles. Except for pockets of wet vegetation formed near irrigation runoff channels, and remnant puddles from spring water releases near the middle and lower part of this section , the creek was dry much of this spring. Despite this lack of permanent water flow, many wet riparian species (song sparrow, yellowthroat, nested successfully. Cliff and rough-winged swallows nested under the three bridges that cross this section of the river. The extensive willow forest on this section where least Bell's vireo once nested has matured and was dry much of this year . Two willow flycatchers were observed here in late May but could not be refound on any subsequent visits.

Area 6 (Table 6). San Francisquito Creek; Santa Clara River upstream to Copper Hill Drive Crossing.

Length of section, 2.5 miles. Along most of this section the riparian zone consists of a broad sandy channel. In the upper part of this section the creek is bordered by land undergoing development. Coastal sage scrub plants occur within the channel as do sections of dry riparian woodland consisting mostly of cottonwoods. Although some water releases from upstream dams occurred during the winter months, no water was present during the survey period except along short sections due to suburban runoff at Copper Hill and at the Decoro Drive crossings Barn owls nested under the Copper Hill bridge and a Cooper's hawk nested about ½ mile south of the Copper Hill crossing.

Area 7 (Table 7). South Fork of the Santa Clara River; McBean Parkway to Magic Mountain Parkway (Route 126).

Length of section, 1.0 miles. The channel along this section of the South Fork is narrow and very sandy. Along most of this section vegetation is restricted to a narrow band of dry woodland at each side of the channel and a few pockets of wet vegetation supported by runoff from adjacent development. No flooding occurred on the South Fork and perennial vegetation was poorly developed due to the lack of much spring rainfall. The cattail marsh near the confluence with the main channel of the Santa Clara river was soured by spring floods and lack of water from the main channel resulted in no new growth during the study period.

Area 8 (Table 8). South Fork of the Santa Clara River, Route 126 upstream to Newhall Creek.

Length of section, 1.4 miles. This section of the river consists of a wide sandy channel intersected by several concrete sills designed to restrict sand movement and flood damage. The river is entirely bordered by developed areas but contains small islands of dry riparian vegetation and some wet riparian areas formed by runoff from culverts along the sides of the creek. No flooding has occurred on this section of the river in recent years and riparian vegetation around these culverts continues to develop into areas of cottonwood and willow woodland, resulting in the continued increase in riparian species along this section of the river.

Comments on Threatened and Endangered Species

Yellow-billed Cuckoo *(Coccyzus americanus)*

The Yellow-billed Cuckoo is listed as a State Endangered Species. Despite playing taped calls of this species during June and July surveys, no individuals of this species were observed in 2004.

Southwestern Willow Flycatcher ***(Empidonax traillii extimus)***

This subspecies is listed as Federally Endangered under the Federal Endangered Species Act. Willow flycatchers were once widespread in wet riparian woodland in southern California but now fewer than 70 pair remain, with the major concentrations being along the Kern River and the Santa Margarita River in San Diego County. Following the Revised Protocol (Fish And Wildlife Service, July 2000) five surveys (see tables 1-8 for dates) were conducted specifically for southwestern willow flycatcher. All surveys occurred between 6:00 and 10:00 am. and used taped calls to elicit a response if flycatchers were not first observed.

A single willow flycatcher was observed on the South Fork of the Santa Clara river on June 11. This bird did not call until a tape was played. Two willow flycatchers were observed on Castaic Creek on May 31st. One of these birds was located by its calling. Despite attempts to relocated these birds on subsequent visits, they could not be relocated.

Willow flycatchers are fairly common migrants through southern California and most of the migrants are believed to be of the more northern common subspecies of willow flycatcher, *E. t. brewsteri,* which breeds throughout southern Canada and the northern United States, rather than representatives of the southwestern subspecies *E. t. extimus*. Southwestern willow flycatchers are positively identified primarily by nesting within the geographic area of their range or by measurements of in hand specimens. Both observations in 2004 were at a time when the northern subspecies is migrating through the area, and lacking any subsequent evidence of nesting, this observations of a willow flycatcher cannot be positively identified as belonging to the southwestern form of willow flycatcher.

The report forms required for this species are attached and will be forwarded to the Ventura Office of the U.S. Fish and Wildlife Service.

Least Bell's Vireo ***(Vireo bellii pusillus)***

Surveys of the wet riparian areas (Areas 1-3,5) followed U.S. Fish and Wildlife Service Guidelines for least Bell's vireo. Eight surveys were conducted between April 10 and July 31 (see Tables 1-3,5 for dates). All surveys occurred between 6:00 and 10:00 am. . The least Bell's vireo is a very vocal species and most birds were located without the use of taped calls. However, tapes were used to elicit responses in early spring, before vireo arrival, in late summer, when vireos were less vocal, and in areas of marginal habitat or where vireos were expected from previous sightings but could not be heard. A calling vireo was considered a territorial male. If a second, silent bird was observed in the same area, a pair was considered to be present.

However, to avoid disturbance, no efforts were made to find nests, locate with certainty females in territories, or to locate fledged young in established territories. Numbers of vireos shown in Table 1 are actual numbers of birds observed. These numbers include all vireos, both singing and silent. In order to avoid disturbing vireos, no special efforts were made to determine nesting success or presence of leg bands once birds were observed. However, at each location where vireos were found, they were observed at least once, and no leg bands were observed.

Least Bell's vireos were regularly observed along the Santa Clara River at Castaic Junction in an extensive stand of willows (Figure 3, area 7). An early survey (May 1st) found 10 singing birds, but 4 of these were not found in any subsequent visits. . Vireos were regularly heard in at least six locations and are thought to represent mated pairs. Although vireos have been present in previous years along Castaic Creek (Figure 3, area 6), none were found there this year.

Comments on Sensitive Species

Great Blue Heron *(Ardea herodias)*

Great blue herons are listed on the California Natural Diversity Data Base as a species that warrants monitoring. Herons were occasionally observed along the Santa Clara River at Castiac Junction. No nesting was observed

Great Egret (Ardea alba)

The great egret is listed on the California Natural Diversity Data Base as a species that warrants monitoring. A single individual was near Castaic Junction in early Spring. There was no evidence of breeding.

White-tailed Kite (*Elanus leucurus*)

This species, formerly the black-shouldered kite, is considered a Species of Special Concern by the State of California. A pair of kites nested near the railroad bridge between the McBean crossing and Interstate 5 and a second pair nested in the dry riparian woodland near Travel Village west of Castaic Junction. A third pair may have nested along the upper reaches of San Francisquito Creek.

Cooper's Hawk *(Accipiter cooperii)*

Cooper's hawk is considered a Species of Special Concern by the State of California. A Cooper's Hawk nested along San Francisquito Creek a little below the Copper Hill Crossing. Nesting also probably occurred near Travel Village west of Castaic Junction and near the railroad trestle west of McBean Crossing. Single sightings of Cooper's hawks occurred on the upper section of the Santa Clara River and on South Fork.

California Horned Lark (*Eremophila alpestris actia)*

This is a California Special Concern species. Although none were observed nesting on the study site, horned larks are ground nesters that prefer bare hillsides and abandoned fields. A few were observed feeding on bare fields and construction areas along Castaic Creek

Loggerhead Shrike (*Lanius ludovicianus)*

This is a California Special Concern species. Shrikes are resident in the coastal sage scrub areas adjacent to the Santa Clara River. A single bird was observed on June 27 above the Bouquet Canyon Crossing. This bird was hunting but there was no evidence of nesting in the river corridor.

Yellow Warbler *(Dendroica petechia)*

The yellow warbler is considered a Species of Special Concern by the State of California. Yellow warblers prefer wet riparian habitat but are also found in large cottonwoods in drier riparian areas. Singing yellow warblers were observed throughout the survey period along sections 1, 2 (main river from McBean Parkway to Castaic Creek) and 5 (Castaic Creek) and probably nested in these areas. Observations in sections 3, 4, 6 and 8 and occurred only during the migration period.

Yellow-breasted Chat *(Icteria virens)*

The yellow-breasted chat is considered a Species of Special Concern by the State of California. Chats were observed throughout the survey period along the Santa Clara river between the Old Road and the mouth of Castaic Creek.

Southern California Rufous-crowned Sparrow *(Aimophila rificeps canescens)*

This species is considered a California Special Concern species by the Department of Fish and Game and is also a Federal Special Concern species. A few birds visited the the river channel near Castaic Junction and a mile above the Bouquet Canyon Rd crossing. In both areas there is extensive coastal sage habitat adjacent to the river in which this species breeds.

Tricolored Blackbird (*Agelaius tricolor*)

This species is considered a California Special Concern species by the Department of Fish and game and is also a Federal Special Concern Species. A small colony of Tricolored blackbirds nested one year in the 1990's along Castaic Creek and in recent years, one or two sightings of migratory individuals have occurred most years. In 2004 there were no sightings of this species.

Lawrence's Goldfinch (*Carduelis lawrencei*)

This species is a highest priority species on the Audubon Birds to Watch list for 1996 and is a Bird of Management Concern for the Fish and Wildlife Service. Small numbers of this species were observed along Castaic Creek and along the Santa Clara river between the mouth of Castaic Creek and the McBean Parkway bridge. This species is a resident in coastal sage habitat

Comments of Brown-headed Cowbirds

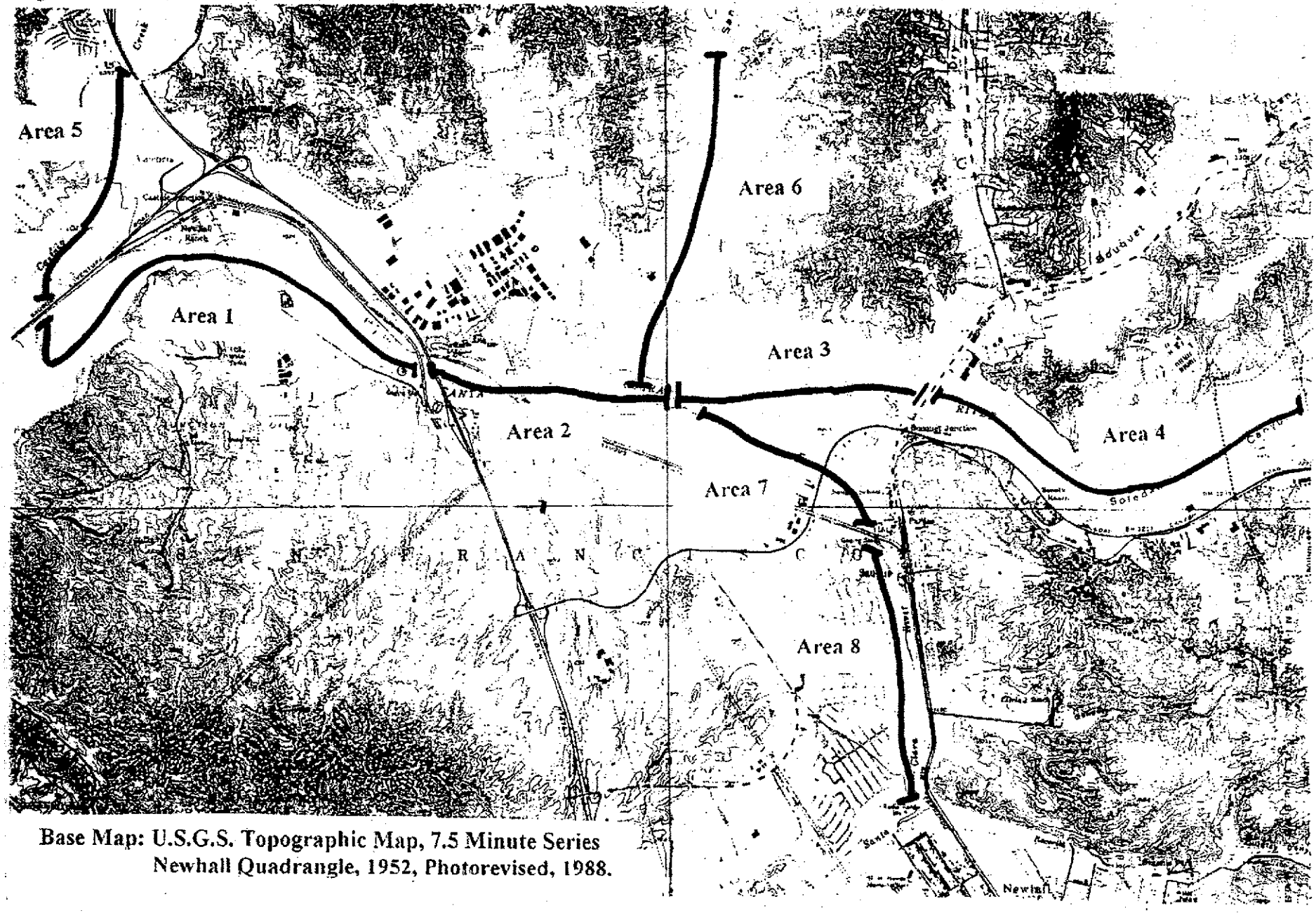
Although not a Species of Concern, comments about this species are warranted due to its influence on several endangered species. Cowbirds were regularly observed along all sections of the Santa Clara River, usually flying along the riparian corridor searching for either mates or potential nests to parasitize. Cowbird females often responded to taped calls of least Bell's Vireo. Cowbird traps were operated throughout the study period just north of the Valencia Wastewater outfall (section 1).

Summary

No yellow-billed cuckoos were observed in 2004. Three willow flycatchers were observed during the migration period for this species. Based on the behavior of these birds and failure to find them on subsequent visits, they are thought to be migrants passing through the area. It is not known which subspecies these birds represented. Up to six pairs of Least Bell's vireos were regularly observed at Castaic Junction. Additional territorial males observed early in the season could not be relocated in later surveys.

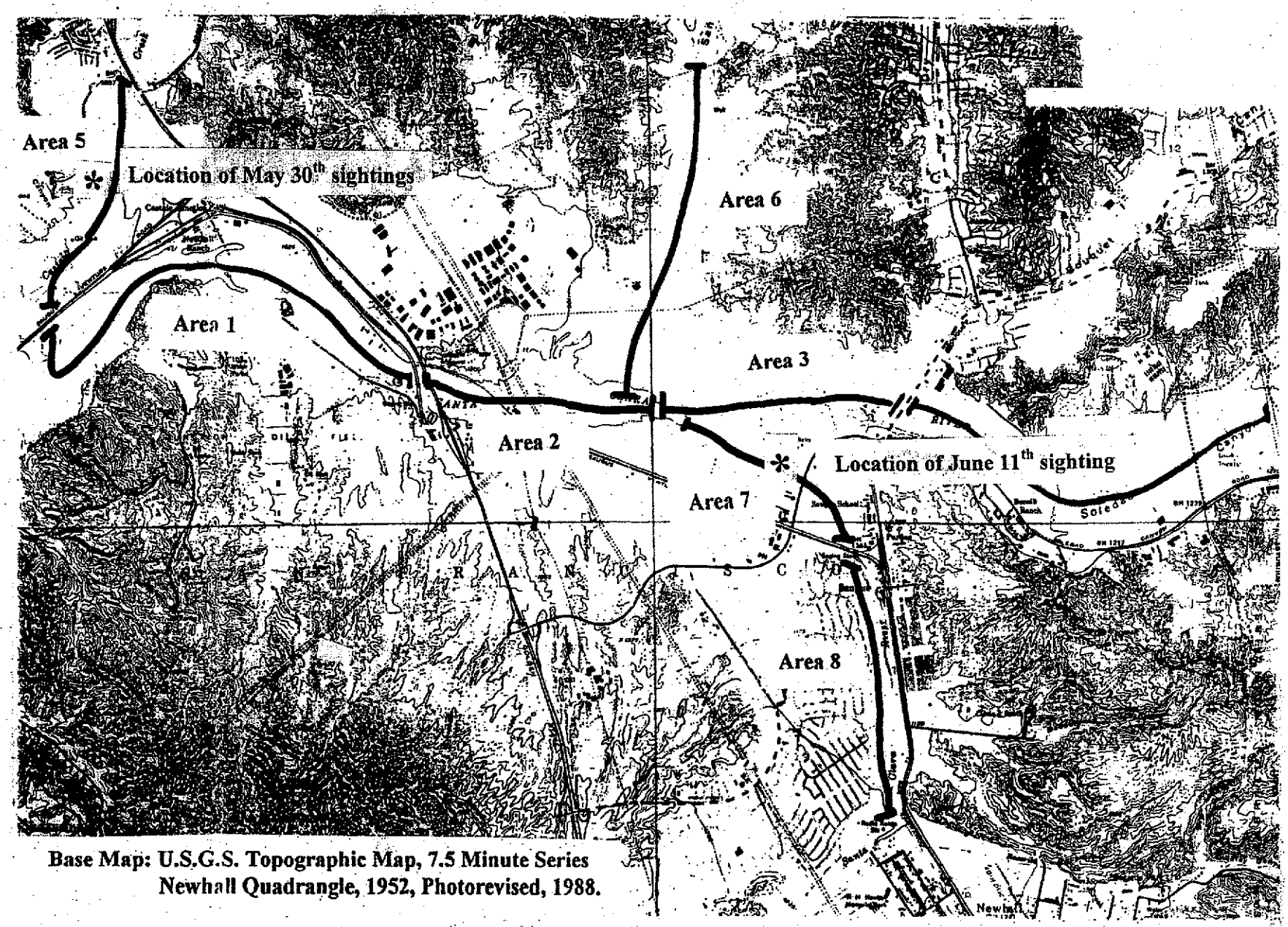
Four riparian Species of Concern, white-tailed kite, Cooper's hawk, yellow warbler and yellow-breasted chat nested in small numbers along wet sections of the river. Other Species of Concern include two migrant or wintering species; great blue heron and great egret and three visitors from nearby coastal sage scrub habitat; horned lark, loggerhead shrike and rufous-crowned sparrow. Cowbirds were numerous along the wet sections of the river where the wet riparian species that they parasitize were present.

Figure 1. Survey Areas along the Santa Clara River and Tributaries.



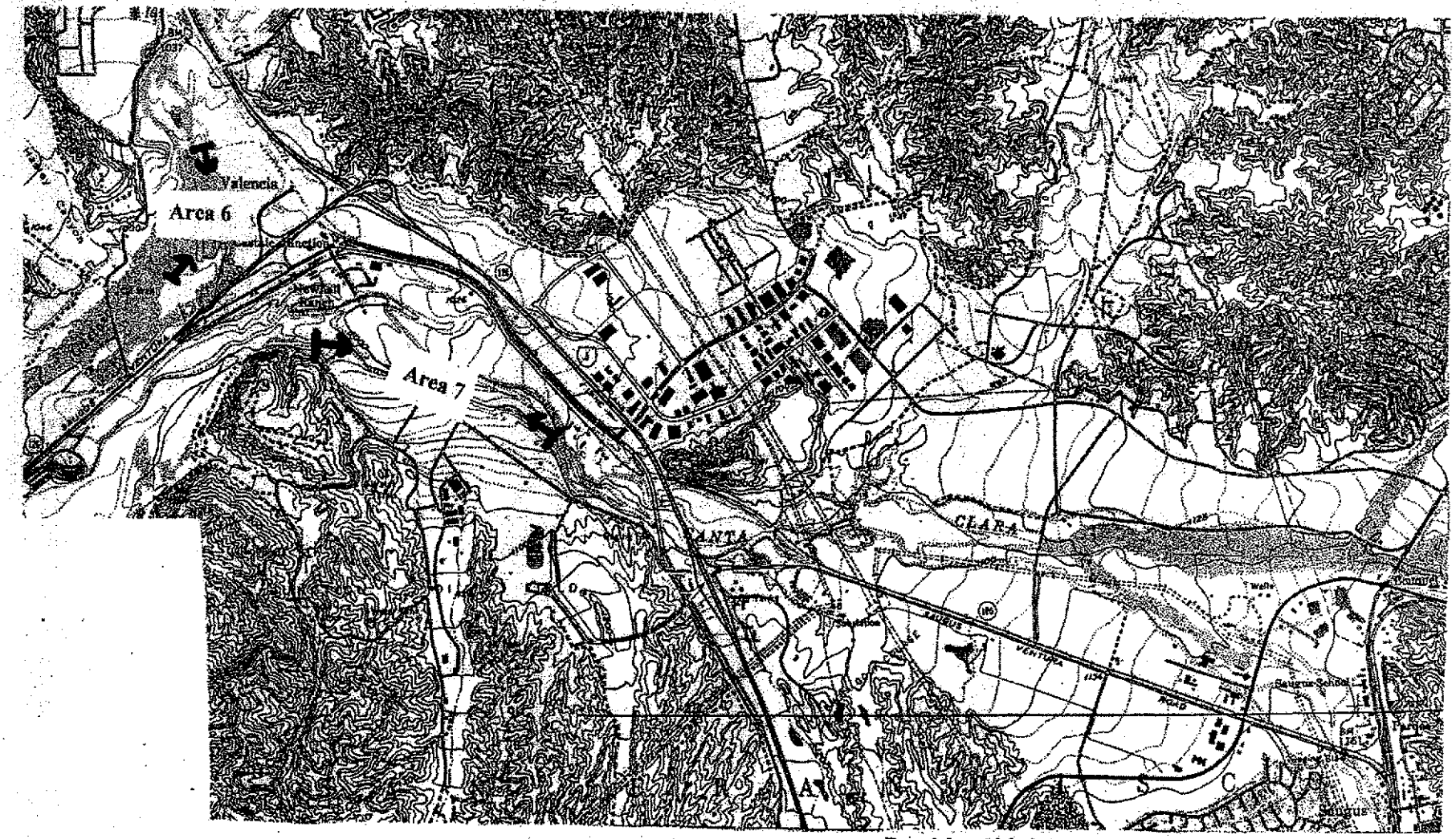
Base Map: U.S.G.S. Topographic Map, 7.5 Minute Series
Newhall Quadrangle, 1952, Photorevised, 1988.

Figure 2. Observations of willow flycatcher in 2004.



Base Map: U.S.G.S. Topographic Map, 7.5 Minute Series Newhall Quadrangle, 1952, Photorevised, 1988.

Figure 3. Location of Least Bell's Vireo breeding records near Castaic Junction.



Base Map: U.S.G.S. Topographic Map, 7.5 Minute Series
Newhall Quadrangle, 1952, Photorevicsed, 1988

Table 1. BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: Santa Clara River from The Old Road downstream to the mouth of Castaic Creek.

Endangered Species and Species of Concern Shaded

		Dates of Surveys							
SPECIES	**STATUS**	**4/13**	**5/1**	**5/18**	**5/28**	**6/9**	**6/22**	**7/2**	**7/13**
Great Blue Heron	m,w	2	0	0	0	2	6	2	0
Great Egret	m,w	1	0	0	0	0	0	0	0
Snowy Egret	m,w	1	0	0	0	0	0	0	0
Green Heron	r	5	2	4	6	3	3	6	2
Black-crowned Night-heron	m,w	0	0	1	0	8	3	1	0
Turkey Vulture	s	0	0	0	0	3	0	0	0
Mallard	r	12	4	16(22)	5	11(12)	5	0	19
White-tailed Kite	r	1	0	6	2	7	0	0	0
Cooper's Hawk	r	0	0	0	0	0	0	0	1
Red-shouldered Hawk	r	1	0	5(1)	3	1	5	0	2
Red-tailed Hawk	r	0	0	4	0	3	0	0	0
California Quail	r	12	7	10	12	12	5	22	48
Killdeer	r	12	3	16	9	18	4	0	0
Spotted Sandpiper	s	0	1	7	2	10	2	0	2
Rock Dove	r	6	4	0	0	0	0	0	0
Mourning Dove	r	28	8	51	10	25	24	16	29
White-th. Swift	r	0	0	2	4	3	8	0	2
Black-chinned Hummingbird	s	0	1	0	0	0	1	0	7
Anna's Hummingbird	r	3	12	1	8	2	10	0	22
Costa's Hummingbird	s	1	0	0	0	0	0	0	2
Rufous Hummingbird	m	0	0	0	0	0	0	1	0
Belted Kingfisher	m	2	0	1	0	0	0	0	0
Nuttall's Woodpecker	r	5	2	3	9	11	14	9	10
Downy Woodpecker	r	4	3	9	2	2	16	3	5
Hairy Woodpecker	r	1	0	2	2	2	2	0	3
Pacific Slope Flycatcher	s	0	1	2	8	2	0	0	0
Black Phoebe	r	1	4	6	3	20	15	14	28
Ash-throated Flycatcher	s	10	8	24	11	13	15	5	29
Western Kingbird	s	0	0	0	0	0	0	0	2
Bell's Vireo	s	0	10	4	0	8	4	4	8
Western Scrub Jay	r	15	7	14	14	16	7	6	10
American Crow	r	0	7	10	5	18	11	5	5
Common Raven	r	33	2	11	15	17	22	16	41
Horned Lark	r	0	0	0	0	0	0	25	6
Tree Swallow	s	0	0	2	0	0	1	0	0
Violet-green Swallow	s	1	1	4	0	5	3	11	0
N. Rough-winged Swallow	s	14	13	36	32	102	49	25	8
Cliff Swallow	s	44	2	49	210	82	43	58	18
Barn Swallow	s	0	0	0	0	13	4	1	2
Oak Titmouse	r	8	6	9	26	10	10	2	33
Bushtit	r	14	32	49	4	70	65	0	43
Bewick's Wren	r	29	19	60	84	56	40	23	44
House Wren	r	26	3	22	29	6	0	0	3

Table 1 (cont.). BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: Santa Clara River from The Old Road downstream to the mouth of Castaic Creek.									
Endangered Species and Species of Concern Shaded									
				Dates of Surveys					
SPECIES	**STATUS**	**4/13**	**5/1**	**5/18**	**5/28**	**6/9**	**6/22**	**7/2**	**7/13**
Western Bluebird	r	2	8	0	2	4	14	8	8
Wrentit	r	4	6	17	8	12	10	5	19
Northern Mockingbird	r	0	0	0	0	0	1	0	2
California Thrasher	r	2	4	4	2	1	2	1	6
European Starling	r	8	5	5	3	2	2	40	5
Phainopepla	r	0	0	0	0	0	6	0	4
Orange-crowned Warbler	w,m	8	0	0	0	0	0	0	0
Yellow Warbler	s,m	2	4	11	15	10	12	14	5	0
Yellow-rumped Warbler	w,m	18	0	0	0	0	0	0	0
Common Yellowthroat	r	25	37	56	84	144	160	22	28
Wilson's Warbler	m	33	7	0	2	0	0	0	0
Yellow-breasted Chat	s	6	2	0	0	2	0	4	0	0
Spotted Towhee	r	28	22	24	10	22	23	6	2
California Towhee	r	57	29	42	60	7	13	18	37
Rufous-crowned Sparrow	r	0	0	0	0	0	0	0	1
Lark Sparrow	r	0	0	2	0	0	0	11	6
Song Sparrow	r	96	100	160	140	192	165	42	68
Black-headed Grosbeak	s	7	16	26	23	36	24	13	18
Blue Grosbeak	s	0	1	0	1	4	6	4	18
Lazuli Bunting	s	0	0	0	0	6	19	3	19
Red-winged Blackbird	s	26	55	5	105	0	3	23	200
Brown-headed Cowbird	s	4	11	10	5	7	6	11	2
Hooded Oriole	s	0	0	0	1	0	0	1	0
Bullock's Oriole	s	4	2	1	4	5	2	6	0
House Finch	r	4	16	8	45	20	67	157	153
Lesser Goldfinch	r	12	0	1	1	10	2	5	17
American Goldfinch	w,m,r	22	0	0	0	0	0	0	0
House Sparrow	r	0	0	0	0	0	2	0	0
.									
Status: m, migrant; r, resident; s, summer only; w, winter									
numbers in parentheses are nestlings.									

Table 2. BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: Santa Clara River from McBean Highway to The Old Road.

Endangered Species and Species of Concern Shaded

		Dates of Surveys							
SPECIES	STATUS	4/13	5/1	5/18	5/28	6/9	6/22	7/2	7/13
Snowy Egret	m	0	1	0	0	0	0	0	0
Mallard	r	0	0	0	0	2	0	0	0
White-tailed Kite	r	0	1	1	0	0	0	0	0
Cooper's Hawk	r	0	0	0	0	1	2	0	0
Red-shouldered Hawk	r	0	0	0	1	2	0	1	0
Red-tailed Hawk	r	0	0	1	0	2	1	1	0
American Kestrel	r	0	0	0	2	0	0	0	0
California Quail	r	6	6	0	2	0	0	0	0
Killdeer	r	3	1	0	0	0	0	0	0
Mourning Dove	r	12	11	4	3	3	2	2	5
Greater Roadrunner	r	0	0	1	0	0	0	0	0
Barn Owl	r	1	0	0	0	0	0	0	0
White-th. Swift	r,m	0	6	0	0	0	0	0	0
Anna's Hummingbird	r	2	3	0	0	2	1	3	2
Nuttall's Woodpecker	r	1	2	4	4	1	4	4	2
Downy Woodpecker	r	0	0	0	0	1	2	1	1
Hairy Woodpecker	r	1	2	0	0	0	1	0	0
Pacific Slope Flycatcher	s	1	0	0	0	0	0	0	0
Black Phoebe	r	0	2	2	3	4	6	4	4
Ash-throated Flycatcher	s	3	3	5	3	4	2	5	3
Warbling Vireo	r	0	4	0	0	0	0	0	0
Western Scrub Jay	r	8	10	3	5	5	5	7	3
American Crow	r	2	2	2	0	1	6	0	0
Common Raven	r	4	2	12	4	5	2	8	3
N. Rough-winged Swallow	s	2	12	2	0	6	6	3	6
Cliff Swallow	s	0	10	6	8	12	12	3	0
Barn Swallow	s	0	1	0	0	0	0	0	0
Oak Titmouse	r	4	2	2	2	2	0	0	5
Bushtit	r	9	12	10	3	12	0	0	2
White-breasted Nuthatch	r	0	1	2	0	0	0	0	0
Bewick's Wren	r	16	9	3	6	4	5	4	6
House Wren	r	11	11	2	2	1	0	0	0
Western Bluebird	r	0	2	0	0	1	2	0	1
American Robin	r	0	0	0	0	0	1	0	0
Wrentit	r	1	0	0	1	0	0	0	0
Northern Mockingbird	r	1	0	0	0	0	0	0	1
California Thrasher	r	5	0	0	0	0	1	0	0
European Starling	r	4	11	2	3	0	0	0	1
Cedar Waxwing	w,m	0	8	1	0	0	0	0	0
Phainopepla	r	0	0	0	0	1	1	0	2
Orange-crowned Warbler	s	1	0	0	0	0	0	0	0
Yellow Warbler	m	2	5	0	0	1	12	0	0
Common Yellowthroat	r	3	4	3	5	5	2	8	1

Table 2 (cont.). BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: Santa Clara River from McBean Highway to The Old Road.									
Endangered Species and Species of Concern Shaded									
		Dates of Surveys							
SPECIES	STATUS	4/13	5/1	5/18	5/28	6/9	6/22	7/2	7/13
Spotted Towhee	r	6	11	6	15	7	9	4	3
California Towhee	r	7	9	4	4	3	0	4	6
Song Sparrow	r	24	40	20	14	3	6	8	8
Black-headed Grosbeak	s	3	13	7	8	6	5	5	1
Blue Grosbeak	s	0	0	0	0	0	0	1	0
Red-winged Blackbird	r	1	0	0	0	0	0	0	0
Western Meadowlark	r	0	0	1	0	0	0	0	0
Brown-headed Cowbird	r	0	3	0	1	0	0	0	0
Bullock's Oriole	s	0	0	2	0	1	0	1	0
House Finch	w,m,r	5	8	14	11	12	40	44	66
Lesser Goldfinch	r	0	0	0	0	4	0	5	0
American Goldfinch	m,s	2	2	0	0	0	0	0	0
Status: m, migrant; r, resident; s, summer only; w, winter									
numbers in parentheses are nestlings									

Table 3. BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: Santa Clara River from Boquet Canyon Bridge to McBean Parkway Bridge

Endangered Species and Species of Concern Shaded

		Dates of Surveys							
SPECIES [1]	**STATUS**	**4/13**	**5/1**	**5/18**	**5/28**	**6/9**	**6/22**	**7/2**	**7/13**
Great Egret	m	0	0	0	0	0	0	0	0
Mallard	r	2	0	2	3	2	1	0	0
Cooper's Hawk	r	0	0	0	0	0	0	0	0
Red-tailed Hawk	r	0	0	1	1	2	1	0	0
California Quail	r	2	2	0	2	0	0	8	4
Killdeer	r	5	1	2	2	4	2	4	0
Rock Dove	r	0	0	0	0	0	4	0	0
Mourning Dove	r	5	6	6	3	3	7	8	2
Greater Roadrunner	r	1	0	0	0	0	0	0	0
Black-chinned Hummingbird	s	0	0	0	0	0	0	2	0
Anna's Hummingbird	r	0	1	2	0	3	1	5	3
Nuttall's Woodpecker	r	1	1	1	0	0	0	3	3
Western Wood Pewee	m	0	0	1	0	0	0	0	0
Gray Flycatcher	m	1	0	0	0	0	0	0	0
Say's Phoebe	r	0	1	0	0	0	0	0	0
Black Phoebe	r	3	2	2	2	3	2	3	4
Ash-throated Flycatcher	s	1	3	2	2	0	2	2	4
Western Kingbird	s	1	1	1	0	0	0	0	0
Western Scrub Jay	r	8	6	8	4	3	5	3	3
American Crow	r	0	2	0	0	2	1	1	1
Common Raven	r	20	16	36	21	46	54	29	6
N. Rough-winged Swallow	s	3	0	2	2	2	8	10	2
Cliff Swallow	s	20	14	3	14	7	3	14	4
Barn Swallow	s	3	0	0	3	0	0	4	0
Oak Titmouse	r	2	0	1	0	0	0	0	0
Bushtit	r	0	3	5	0	0	0	4	0
Bewick's Wren	r	10	4	5	3	1	4	3	3
House Wren	r	0	0	1	1	0	0	0	0
Western Bluebird	r	0	1	0	0	1	0	0	0
Wrentit	r	0	0	0	0	1	1	0	0
Northern Mockingbird	r	1	2	4	2	1	0	2	1
California Thrasher	r	0	1	0	0	0	0	0	1
European Starling	r	1	2	5	0	0	3	0	0
Cedar Waxwing	w,m	0	0	8	0	0	0	0	0
Phainopepla	r	1	0	0	0	1	1	0	0
Yellow Warbler	s	0	0	4	0	0	0	0	0
Yellow-rumped Warbler	w,m	3	0	0	0	0	0	0	0
MacGillivray's Warbler	m	1	0	0	0	0	0	0	0
Common Yellowthroat	r	3	2	4	3	3	3	0	1
Wilson's Warbler	m	3	0	0	1	0	0	0	0
Spotted Towhee	r	7	3	4	4	3	4	2	0
California Towhee	r	2	0	2	2	0	0	1	2
Lark Sparrow	r	0	0	0	0	0	1	0	0

Table 3 cont.). BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: Santa Clara River from Boquet Canyon Bridge to McBean Parkway Bridge

Endangered Species and Species of Concern Shaded

		Dates of Surveys							
SPECIES	**STATUS**	**4/13**	**5/1**	**5/18**	**5/28**	**6/9**	**6/22**	**7/2**	**7/13**
Song Sparrow	r	16	16	20	12	12	7	2	2
Black-headed Grosbeak	s	2	0	1	1	1	0	1	0
Red-winged Blackbird	r	0	0	10	10	2	16	15	0
Brewer's Blackbird	r	0	2	0	0	0	0	0	0
Brown-headed Cowbird	s	1	2	1	0	0	1	4	0
Bullock's Oriole	s	0	0	1	1	0	1	3	0
House Finch	r	18	17	30	17	37	36	24	36
Lesser Goldfinch	r	0	0	0	0	0	2	0	0
American Goldfinch	w,m,r	10	0	0	0	0	0	0	0

Status: m, migrant; r, resident; s, summer only; w, winter

numbers in parentheses are nestlings

Table 4. BIRD SURVEYS OF THE SANTA CLARA RIVER BASIN, 2004: Santa Clara River from Boquet Canyon Bridge upstream for two miles.

Endangered Species and Species of Concern Shaded

SPECIES	STATUS	Dates of Surveys 5/16	6/12	6/27	7/4	7/16
Mallard	r	2	0	0	0	0
White-tailed Kite	r	1	0	0	0	0
Red-tailed Hawk	r	2	0	1	2	1
California Quail	r	82	4	9	5	3
Killdeer	r	12	0	0	0	0
Rock Dove	r	8	0	0	0	0
Mourning Dove	r	122	8	16	4	6
Greater Roadrunner	r	1	0	0	0	0
Black-chinned Hummingbird	s	1	0	0	1	0
Anna's Hummingbird	r	7	3	2	5	2
Costa's Hummingbird	s	1	0	0	0	0
Nuttall's Woodpecker	r	4	1	3	2	1
Downy Woodpecker	r	1	0	0	0	0
Northern Flicker	r	0	1	0	0	0
Say's Phoebe	r	2	1	0	0	0
Ash-throated Flycatcher	s	5	0	0	1	0
Western Kingbird	s	8	0	0	0	0
Loggerhead Shrike	r	0	0	1	0	0
Western Scrub Jay	r	27	12	15	9	6
American Crow	r	0	3	2	4	0
Common Raven	r	2	5	10	23	5
N. Rough-winged Swallow	s	2	2	1	0	0
Cliff Swallow	s	7	0	0	0	3
Barn Swallow	s	0	1	0	0	0
Oak Titmouse	r	4	0	0	0	0
Bushtit	r	19	5	2	6	2
Bewick's Wren	r	17	5	7	3	2
Wrentit	r	5	1	2	2	2
Northern Mockingbird	r	18	8	4	8	5
California Thrasher	r	8	0	1	0	0
European Starling	r	4	0	9	0	0
Phainopepla	r	30	8	2	6	3
Yellow Warbler	s/m	2	0	0	0	0
Spotted Towhee	r	22	5	6	0	0
California Towhee	r	28	4	11	10	4
Rufous-crowned Sparrow	r	4	0	0	2	0
Black-headed Grosbeak	s	4	0	0	2	0
Brown-headed Cowbird	s	2	0	1	0	0
Hooded Oriole	s	1	0	0	0	0
Bullock's Oriole	s	13	0	2	5	3
House Finch	r	60	26	41	45	45
House Sparrow	r	2	0	0	0	0

Status: m, migrant; r, resident; s, summer only; w, winter

numbers in parentheses are nestlings

Table 5. BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: Castaic Creek from I-5 to the Santa Clara River

Endangered Species and Species of Concern Shaded

		Dates of Surveys							
SPECIES	**STATUS**	**4/15**	**5/6**	**5/19**	**5/30**	**6/10**	**6/23**	**7/3**	**7/14**
White-tailed Kite	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cooper's Hawk	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Red-shouldered Hawk	r	0	0	1	1	0	0	0	0
Red-tailed Hawk	r	1	2	2	4	9	2	2	0
American Kestrel	r	2	2	2	2	5	3	0	1
California Quail	r	76	25	14	21	31	52	68	21
Killdeer	r	5	2	0	3	3	2	0	0
Rock Dove	r	0	1	0	7	53	19	19	6
Mourning Dove	r	20	16	33	14	12	23	48	16
Black-chinned Hummingbird	s	0	1	0	2	0	1	0	6
Anna's Hummingbird	r	3	8	8	10	8	10	6	29
Costa's Hummingbird	s	0	0	0	1	1	1	1	1
Rufous Hummingbird	m	0	0	0	0	0	0	1	0
Nuttall's Woodpecker	r	1	7	3	0	7	6	3	5
Downy Woodpecker	r	7	2	2	3	6	5	6	0
Hairy Woodpecker	r	3	2	0	2	0	0	0	2
Northern Flicker	r	0	2	2	1	7	2	3	1
Western Wood-Pewee	m	0	0	0	2	0	0	0	0
Willow Flycatcher	[illegible]	0	0	0	2	0	0	0	0
Pacific Slope Flycatcher	s	0	0	0	1	0	0	0	0
Black Phoebe	r	0	2	0	0	2	0	0	2
Say's Phoebe	r	0	0	0	0	0	0	2	0
Ash-throated Flycatcher	s	7	8	6	5	18	5	9	1
Western Kingbird	s	0	2	3	2	0	8	6	0
Warbling Vireo	m	1	1	0	0	0	0	0	0
Western Scrub Jay	r	13	18	8	17	15	22	23	18
American Crow	r	0	4	3	5	1	0	1	0
Common Raven	r	9	3	2	5	1	9	4	13
Horned Lark	r	0	0	3	0	4	0	3	0
Violet-green Swallow	s	2	0	0	0	0	0	0	0
N. Rough-winged Swallow	s	44	23	34	48	25	15	9	0
Cliff Swallow	s	200	300	455	482	371	60	235	32
Barn Swallow	s	0	0	0	0	2	4	0	4
Oak Titmouse	r	4	13	9	6	8	21	8	12
Bushtit	r	6	4	8	34	26	31	2	31
Bewick's Wren	r	24	16	18	25	33	12	18	14
House Wren	r	11	0	0	10	6	4	0	2
Western Bluebird	r	0	0	2	5	0	3	3	0
American Robin	r	2	0	0	0	0	2	2	0
Wrentit	r	4	6	7	6	8	6	3	3
Northern Mockingbird	r	0	1	0	1	0	0	0	0
California Thrasher	r	12	9	2	4	7	4	16	3
European Starling	r	2	4	11	9	5	0	35	0

Table 5 (cont.). BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: Castaic Creek from I-5 to the Santa Clara River

Endangered Species and Species of Concern Shaded

		Dates of Surveys							
SPECIES	**STATUS**	**4/15**	**5/6**	**5/19**	**5/30**	**6/10**	**6/23**	**7/3**	**7/14**
Orange-crowned Warbler	w,m	2	0	0	0	0	0	0	0
Nashville Warbler	m	1	0	0	0	0	0	0	0
Yellow Warbler	s,m	0	4	3	0	4	0	100	0
Yellow-rumped Warbler	w,m	4	0	0	0	0	0	0	0
Common Yellowthroat	r	3	1	4	7	7	4	1	0
Wilson's Warbler	m	9	4	0	0	0	0	0	0
Yellow-breasted Chat	s	0	0	0	1	0	0	0	0
Spotted Towhee	r	17	26	20	21	39	10	26	4
California Towhee	r	32	35	18	18	39	19	55	20
Lark Sparrow	r	0	0	0	0	0	0	1	0
Song Sparrow	r	19	17	14	12	15	2	0	0
Black-headed Grosbeak	s	10	15	7	13	14	14	14	0
Blue Grosbeak	s	0	3	0	2	0	0	2	0
Red-winged Blackbird	s	4	9	7	6	0	5	40	0
Brewer's Blackbird	r	0	0	0	2	0	0	2	0
Brown-headed Cowbird	s	9	3	5	0	0	0	0	1
Hooded Oriole	s	0	1	2	0	0	0	0	1
Bullock's Oriole	s	2	6	2	5	7	2	0	0
House Finch	r	14	16	80	29	72	56	35	40
Lesser Goldfinch	r	6	2	4	3	1	4	0	1
House Sparrow	r	16	0	8	11	10	28	9	2

Status: m, migrant; r, resident; s, summer only; w, winter

numbers in parentheses are nestlings

Table 6. BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: San Francisquito Creek from Santa Clara River to Copper Hill Drive.								
Endangered Species and Species of Concern Shaded								
				Dates of Surveys				
SPECIES	STATUS	5/17	6/11	6/26	7/6	7/17		
White-tailed Kite	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0		
Northern Harrier	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0		
Red-tailed Hawk	r	2	4	3	1	1		
American Kestrel	r	2	2	0	1	2		
California Quail	r	18	41	5	19	4		
Killdeer	r	1	4	0	0	0		
Rock Dove	r	4	0	0	0	0		
Mourning Dove	r	50	28	32	23	15		
Barn Owl	r	3	2	0	4	2		
Black-chinned Hummingbird	s	0	0	1	0	3		
Anna's Hummingbird	r	3	7	6	7	7		
Costa's Hummingbird	s	0	0	1	0	0		
Nuttall's Woodpecker	r	3	5	5	3	3		
Black Phoebe	r	0	1	1	3	0		
Say's Phoebe	r	3	0	0	0	0		
Ash-throated Flycatcher	s	4	6	4	3	3		
Western Kingbird	s	2	6	10	6	1		
Western Scrub Jay	r	10	8	10	5	8		
American Crow	r	2	0	0	1	1		
Common Raven	r	12	3	9	7	6		
N. Rough-winged Swallow	s	1	4	0	0	0		
Cliff Swallow	s	2	8	56	8	11		
Barn Swallow	s	1	1	1	0	1		
Oak Titmouse	r	0	4	0	0	0		
Bushtit	r	0	3	2	18	3		
Bewick's Wren	r	10	8	8	3	6		
House Wren	r	1	0	0	0	0		
Western Bluebird	r	0	1	4	2	0		
Wrentit	r	0	0	1	0	0		
Northern Mockingbird	r	4	6	6	5	8		
California Thrasher	r	0	1	1	1	0		
European Starling	r	2	3	6	2	8		
Phainopepla	r	27	23	10	12	2		
Yellow Warbler	sm	1	0	0	0	0		
Common Yellowthroat	r	0	0	1	1	0		
Spotted Towhee	r	8	8	6	6	3		
California Towhee	r	20	2	6	7	3		
Song Sparrow	r	6	4	1	0	0		
Black-headed Grosbeak	s	2	2	3	1	2		
Blue Grosbeak	s	0	0	0	0	1		
Lazuli Bunting	s	2	0	0	0	0		
Red-winged Blackbird	s	0	12	5	8	0		
Brewer's Blackbird	r	2	0	0	0	0		

Table 6 (cont.). BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: San Franciscquito Creek from Santa Clara River to Copper Hill Drive.						
Endangered Species and Species of Concern Shaded						
		Dates of Surveys				
SPECIES	STATUS	5/17	6/11	6/26	7/6	7/17
Brown-headed Cowbird	s	1	0	0	1	0
Bullock's Oriole	s	5	13	9	6	3
House Finch	r	66	91	140	175	176
Lesser Goldfinch	r	5	4	5	2	25
Status: m, migrant; r, resident; s, summer only; w, winter						
numbers in parentheses are nestlings						

Table 7. BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: South Fork from Rte 126 downstream to Santa Clara River.

Endangered Species and Species of Concern Shaded

SPECIES	STATUS	5/17	6/11	6/26	7/6	7/17
				Dates of Surveys		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Red-tailed Hawk	r	0	2	1	3	0
California Quail	r	10	10	2	0	1
Rock Dove	r	6	0	0	0	0
Mourning Dove	r	27	9	6	10	4
Greater Roadrunner	r	2	0	0	0	0
Black-chinned Hummingbird	s	3	0	0	1	2
Anna's Hummingbird	r	9	3	5	3	4
Nuttall's Woodpecker	r	2	2	1	2	0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Black Phoebe	r	1	1	0	7	0
Ash-throated Flycatcher	s	5	2	0	0	1
Western Kingbird	s	2	0	0	0	0
Western Scrub Jay	r	11	1	4	0	4
American Crow	r	0	1	2	0	0
Common Raven	r	19	3	4	4	3
N. Rough-winged Swallow	s	18	10	3	0	0
Cliff Swallow	s	28	14	14	0	0
Barn Swallow	s	1	0	0	0	0
Oak Titmouse	r	1	0	0	0	0
Bushtit	r	0	0	2	4	0
Bewick's Wren	r	11	2	8	4	7
House Wren	r	0	0	0	1	0
American Robin	r	0	0	1	0	0
Wrentit	r	3	0	3	0	0
Northern Mockingbird	r	5	2	0	0	1
California Thrasher	r	2	0	0	0	0
European Starling	r	7	2	0	0	0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Spotted Towhee	r	4	0	3	0	0
California Towhee	r	14	0	5	5	1
Song Sparrow	r	2	0	0	0	0
Black-headed Grosbeak	s	1	0	0	0	0
Red-winged Blackbird	s	0	0	2	0	0
Brewer's Blackbird	r	0	0	5	0	0
Brown-headed Cowbird	s	2	0	1	0	0
Bullock's Oriole	s	1	4	0	0	0
House Finch	r	136	49	42	28	32
Lesser Goldfinch	r	4	5	11	3	1
House Sparrow	r	0	8	0	0	1

Status: m, migrant; r, resident; s, summer only; w, winter

numbers in parentheses are nestlings

Table 8. BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: South Fork of the Santa Clara River from Route 126 upstream to Coyote Creek.

Endangered Species and Species of Concern Shaded

		Dates of Surveys				
SPECIES	**STATUS**	**17-May**	**11-Jun**	**26-Jun**	**6-Jul**	**17-Jul**
Mallard	r	0	0	3	0	0
Red-shouldered Hawk	r	1	0	2	0	0
Red-tailed Hawk	r	1	0	2	1	0
California Quail	r	18	26	2	6	33
Killdeer	r	0	3	4	0	2(1)
Mourning Dove	r	12	10	15	9	11
White-th. Swift	r	4	4	2	0	0
Black-chinned Hummingbird	s	1	7	1	6	2
Anna's Hummingbird	r	16	11	3	18	12
Costa's Hummingbird	s	0	2	0	3	0
Rufous Hummingbird	m	0	0	0	1	0
Nuttall's Woodpecker	r	4	3	2	5	2
Downy Woodpecker	r	1	0	0	1	0
Black Phoebe	r	2	2	6	3	3
Say's Phoebe	r	0	0	1	1	1
Ash-throated Flycatcher	s	5	3	0	1	0
Western Kingbird	s	4	0	7	1	3
Western Scrub Jay	r	4	6	16	11	15
American Crow	r	8	3	0	7	3
Common Raven	r	11	8	8	8	6
N. Rough-winged Swallow	s	24	30	2	0	0
Cliff Swallow	s	0	12	2	0	0
Oak Titmouse	r	0	12	1	0	0
Bushtit	r	6	17	5	15	2
Bewick's Wren	r	8	21	1	9	1
House Wren	r	0	4	0	0	2
Western Bluebird	r	0	0	1	0	0
American Robin	r	0	0	2	0	0
Wrentit	r	1	2	4	4	0
Northern Mockingbird	r	5	4	5	2	4
California Thrasher	r	6	5	2	3	5
European Starling	r	4	3	0	0	4
Yellow Warbler	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Common Yellowthroat	r	3	10	3	1	0
Wilson's Warbler	m	1	0	0	0	0
Western Tanager	m	2	0	0	0	0
Spotted Towhee	r	10	8	4	8	2
California Towhee	r	30	21	13	28	13
Song Sparrow	r	10	18	4	4	7
Black-headed Grosbeak	s	5	7	0	4	0
Red-winged Blackbird	s	8	2	0	0	0
Brown-headed Cowbird	s	4	7	4	0	1

Table 8 (cont.). BIRDS OF THE SANTA CLARA RIVER BASIN, 2004: South Fork of the Santa Clara River from Route 126 upstream to Coyote Creek.

Endangered Species and Species of Concern Shaded

		Dates of Surveys				
SPECIES	**STATUS**	**17-May**	**11-Jun**	**26-Jun**	**6-Jul**	**17-Jul**
Hooded Oriole	s	1	0	0	0	0
Bullock's Oriole	s	8	2	2	1	0
House Finch	r	49	52	51	50	103
Lesser Goldfinch	r	2	4	3	8	0
American Goldfinch	w,m,r	0	1	0	0	
House Sparrow	r	11	16	30	3	28

Status: m, migrant; r, resident; s, summer only; w, winter

numbers in parentheses are nestlings

Willow Flycatcher Survey and Detection Form (rev. 4/98)

Site Name____Santa Clara River: Castaic Creek to Boquet Canyon Rd.___Total Site No.

Was site surveyed in previous year? **Yes** Drainage Santa Clara River
If yes, what site name was used? __Upper Santa Clara River: Sections 1-3
County __Los Angeles_____ State__CA____ USGS Quad Name Newhall_____

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? X☐ Yes ☐ No
Site Coordinates: Start: N__34 25.415_____ W 118 32.399_____ UTM
Stop: N__34 25.172_____ W 118 38.070_____ UTM Zone _____
Elevation ____980 - 1125 ft._____ feet / meters (circle one)

***** Fill in additional site information on back of this page *****

Survey # Observer(s)	Date (m/d/y) Survey time	Number of WIFLs Found	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign Y or N	Comments about this survey (e.g., evidence of pairs or breeding, number of nests, nest contents or number of fledges seen; potential threats)
D. Guthrie _J. Sugden____ _____ _____	Date 5/18 start 6:30 stop 9:00 total hrs _2.5___	0	0	0	n	Y	n	
D. Guthrie J. Sugden _____ _____	Date 6/9 Start 6:30 Stop 9:00 total hrs _2.5__	0	0	0	n	Y	N	
D. Guthrie _J.Sugden_____ _ _____	Date 6/22 Start 6:30 Stop 9:00 total hrs _2.5__	0	0	0	n	Y	N	
D. Guthrie __J. Sugden___ _____	Date 7/2 start 6:30 stop 9:00 total hrs 2.5_	0	0	0	n	Y	N	
D. Guthrie _J. Sugden___ _____	Date 7/13 start 6:30 stop 9:00 total hrs _2.5____	0	0	0	n	Y	N	

Overall Site Summary (Total only resident WIFLs) Total survey hrs_25 12.5 guthrie, 12.5 sugden	Adults	Pairs	Territories	Nests	Were any WIFLs color-banded? No If yes, report color combination(s) in the comments section on back of form
	0	0	0	0	

Name of Reporting Individual ____Dan Guthrie_____ Date Report Completed ___7/20/04_____

Submit the original of this form. Retain a copy for your records.

Fill in the following information completely. Submit original form. Retain copy for your records.

Name of Reporting Individual __Dan Guthrie_____Phone # _909 607 2836_____

Affiliation __Claremont Colleges_____ Email dguthrie@jsd.claremont.edu_____

Site Name__Santa Clara River: Castaic Creek to Boquet River Bridge_____
Did you verify that this site name is consistent with that used in previous years? Yes No ? (circle one)
This is a section of site previously lumped as upper Santa Clara River, sections 1-3
Management Authority for Survey Area (circle one):

Federal Municipal/County State Tribal **Private**

Name of Management Entity or Owner (e.g., Tonto National Forest) _Newhall Land Co._____

Length of area surveyed: _5.9 miles_____ (specify units, e.g., miles = mi, kilometers = km, meters = m)

Did you survey the same general area during each visit to this site this year? **Yes /** If no, summarize in comments below.

If site was surveyed last year, did you survey the same general area this year? **Yes /** If no, summarize in comments below.

Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):
Native broadleaf plants
✗✗☐ Mixed native and exotic plants (mostly native)
(entirely or almost entirely, includes high-elevation willow)
☐ Mixed native and exotic plants (mostly exotic) ☐ Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrub species: __Cottonwood, willow, tamarisk_____

Average height of canopy: __40 ft._____ (specify units)

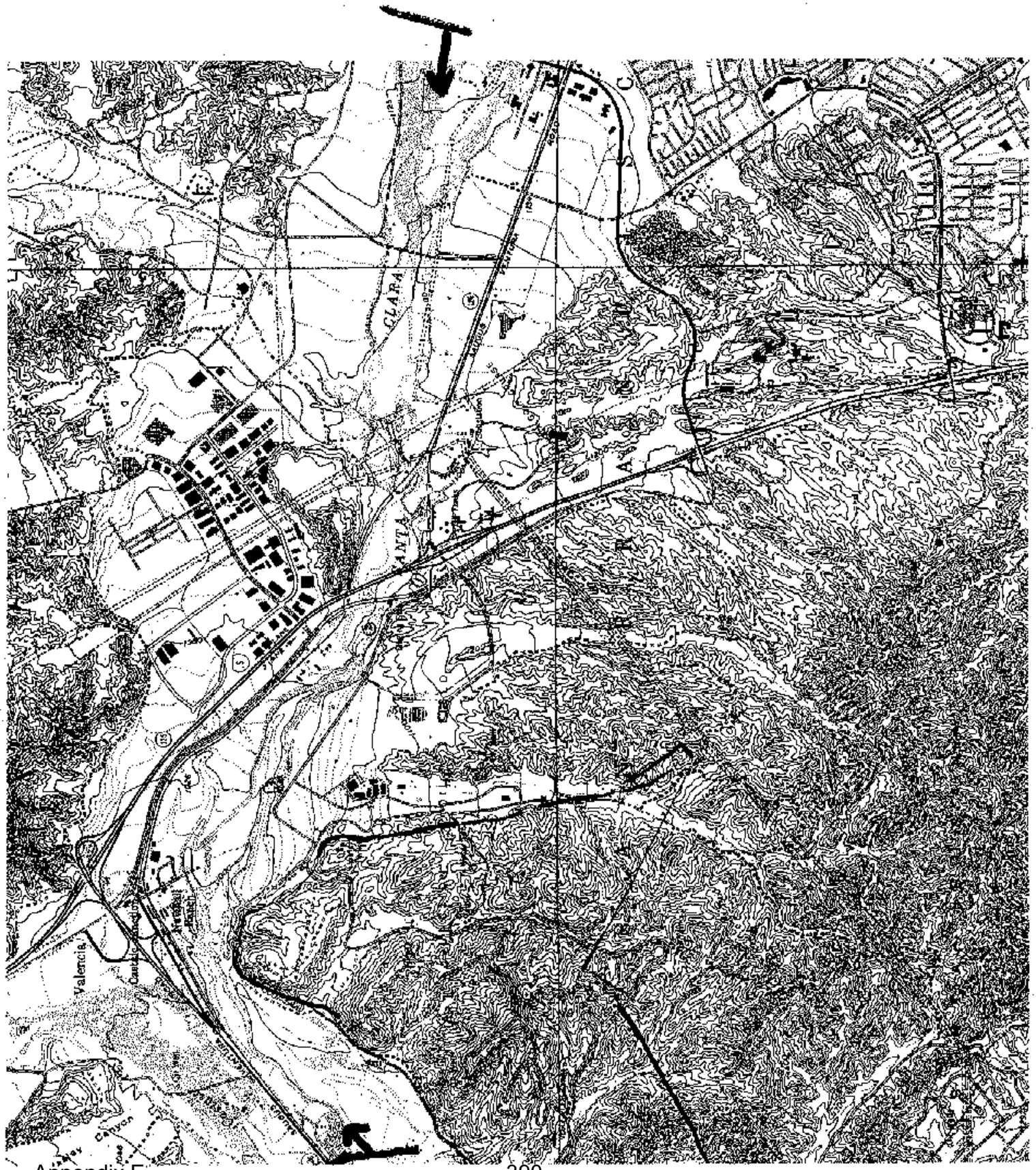
Was surface water or saturated soil present at or adjacent to site? **yes.**
Distance from the site to surface water or saturated soil: _____ (specify units)

Did hydrological conditions change significantly among visits (did the site flood or dry out)? **No** (circle one)
If yes, describe in comments section below. no water present except for 50 yd section trickle in center of section.

Remember to attach a xerox copy of a USGS quad/topographical map (REQUIRED) of the survey area, noting the survey site and location of WIFL detections. You may also include a sketch or aerial photograph showing details of site location, patch shape, survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map.

Comments (attach additional sheets if necessary):_____

_____Santa Clara River flows discontinuously along this section of the river. Water is provided by two sewage treatment plants. There was no natural flow during the survey period._____


Valencia
Canyon
Ranch
CLARA
SANTA

Willow Flycatcher Survey and Detection Form (rev. 4/98)

Site Name____Castaic Creek_____Total Site No _____

Was site surveyed in previous year? Yes No Drainage Santa Clara River
If yes, what site name was used? __Upper Santa Clara River, section 5_____
County __Los Angeles_____ State__CA____ USGS Quad Name Newhall_____

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? X☐ Yes ☐ No
Site Coordinates: Start: N__34 25/306_____ W 118 36.755_____ UTM
Stop: N__34 26_____ W 118 37_____ UTM Zone _____
Elevation ____ 950-1027 ft._____ feet / meters (circle one)

***** Fill in additional site information on back of this page *****

Survey # Observer(s)	Date (m/d/y) Survey time	Number of WIFLs Found	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign Y or N	Comments about this survey (e.g.; evidence of pairs or breeding, number of nests, nest contents or number of fledges seen; potential threats)
J. Sugden _____ _____	Date 5/19 start 6:30 stop 8:30 total hrs _2.0_	0	0	0	n	Y	n	
J. Sugden _____ _____	Date 5/30 Start 6:30 Stop 8:30 total hrs _2.0	2	0	0	n	Y	N	Belived late migrants
J. Sugden _____ _____	Date 6/10 Start 6:30 Stop 8:30 total hrs _2.0__	0	0	0	n	Y	N	
J. Sugden _____ _____	Date 7/3 start 6:30 stop 8:30 total hrs 2.0_	0	0	0	n	Y	N	
J. Sugden _____ _____	Date 7/14 start 6:30 stop 8:30 total hrs _2.0____	0	0	0	n	Y	N	

Overall Site Summary (Total only resident WIFLs)	Adults	Pairs	Territories	Nests	Were any WIFLs color-banded? No
Total survey hrs___10.0_____	2	0	0	0	If yes, report color combination(s) in the comments section on back of form

Name of Reporting Individual ____Dan Guthrie_____ Date Report Completed ___7/20/04_____

Submit the original of this form. Retain a copy for your records.

Fill in the following information completely. Submit original form. Retain copy for your records.

Name of Reporting Individual __Dan Guthrie_____Phone # _909 607 2836_____

Affiliation __Claremont Colleges_____ Email dguthrie@jsd.claremont.edu_____

Site Name__Castaic Creek_____
Did you verify that this site name is consistent with that used in previous years? Yes No ? (circle one)
This is a section of site previously lumped as upper Santa Clara River. section 5.
Management Authority for Survey Area (circle one):

Federal Municipal/County State Tribal **Private**

Name of Management Entity or Owner (e.g., Tonto National Forest) _Newhall Land Co._____

Length of area surveyed: _2 miles_____ (specify units, e.g., miles = mi, kilometers = km, meters = m)

Did you survey the same general area during each visit to this site this year? Yes / If no, summarize in comments below.

If site was surveyed last year, did you survey the same general area this year? Yes / If no, summarize in comments below.

Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):
Native broadleaf plants
✗✗☐ Mixed native and exotic plants (mostly native)
(entirely or almost entirely, includes high-elevation willow)
☐ Mixed native and exotic plants (mostly exotic) ☐ Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrub species: __Cottonwood, willow, tamarisk_____

Average height of canopy: __40 ft._____ (specify units)

Was surface water or saturated soil present at or adjacent to site? No see comment
Distance from the site to surface water or saturated soil: _____see comment

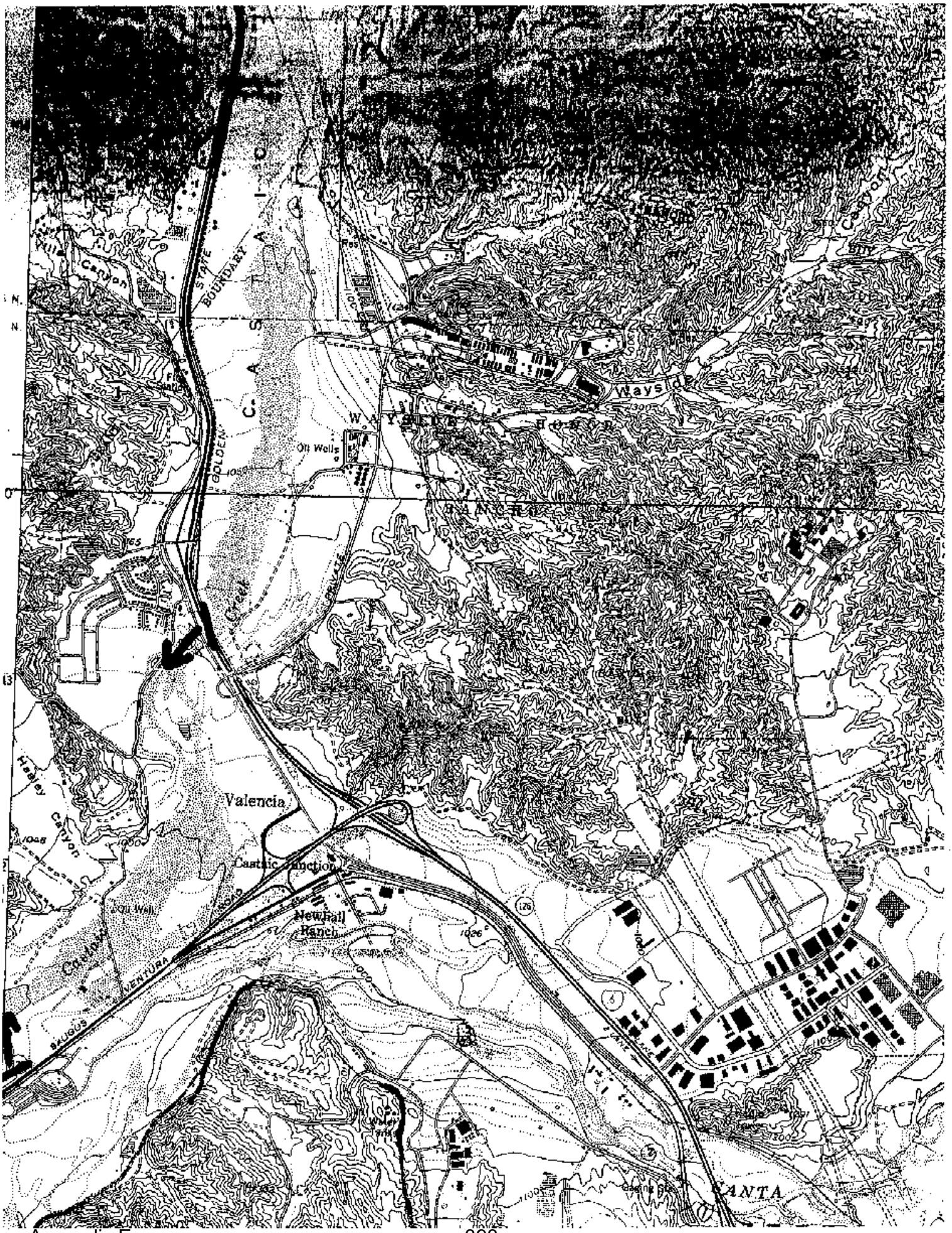
Did hydrological conditions change significantly among visits (did the site flood or dry out)? No (circle one)
If yes, describe in comments section below. no water present except for 50 yd section trickle in center of section.

Remember to attach a xerox copy of a USGS quad/topographical map (REQUIRED) of the survey area, noting the survey site and location of WIFL detections. You may also include a sketch or aerial photograph showing details of site location, patch shape, survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map.

Comments (attach additional sheets if necessary):_____

Water in this section of Castaic Creek comes from releases from Castaic Dam. There were no releases during the survey period. Some residential runoff was present at upper section of survey area but the rest of the creek was dry. Nearest water in Santa Clara River a mile away.

The timing of this sighting suggestes that the bird was a migrant passing through the area. Its identity to subspecies is not known. It may have belonged to a subspecies other than southwestern.


STATE BOUNDARY
GOLDEN
Canyon
Oil Wells
Valencia
Castaic Junction
Newhall Ranch
Hasley Canyon
Oil Well
VENTURA
BAUGUS
Creek
Wayside
Canyon
SANTA

Willow Flycatcher Survey and Detection Form (rev. 4/98)

Site Name____Santa Clara River above Bouquet Canyon rd._____Total Site No _____

Was site surveyed in previous year? Yes No Drainage Santa Clara River
If yes, what site name was used? __same as above_____
County __Los Angeles_____ State__CA____ USGS Quad Name Newhall_____

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? X☐ Yes ☐ No
Site Coordinates: Start: N__34 25.415_____ W 118 32.399_____ UTM
Stop: N__34 25.515_____ W 118 30.125 UTM Zone _____
Elevation ____1125-1320 ft._____ feet / meters (circle one)

***** Fill in additional site information on back of this page *****

Survey # Observer(s)	Date (m/d/y) Survey time	Number of WIFLs Found	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign Y or N	Comments about this survey (e.g.; evidence of pairs or breeding, number of nests, nest contents or number of fledges seen; potential threats)
J. Sugden	Date 5/16 start 6 stop 7:30 total hrs _1.5_	0	0	0	N	n	n	
d. Guthrie	Date 6/12 Start 6:00 Stop 7:30 total hrs _1.5__	0	0	0	n	n	N	
D. Guthrie	Date 6/27 Start 6:00 Stop 7:30 total hrs _1.5__	0	0	0	n	n	N	
D. Guthrie	Date 7/4 start 6:00 stop 7:30 total hrs 1.50_	0	0	0	n	n	N	?
D. Guthrie	Date 7/15 start 6:00 stop 7:30 total hrs _1.5__	0	0	0	n	n	N	

Overall Site Summary (Total only resident WIFLs)	Adults	Pairs	Territories	Nests	Were any WIFLs color-banded? No
Total survey hrs___7.5_____	0	0	0	0	If yes, report color combination(s) in the comments section on back of form

Name of Reporting Individual ____Dan Guthrie_____ Date Report Completed ___7/20/04_____

Submit the original of this form. Retain a copy for your records.

Fill in the following information completely. Submit original form. Retain copy for your records.

Name of Reporting Individual ___Dan Guthrie_____Phone # _909 607 2836_____

Affiliation __Claremont Colleges_____ Email dguthrie@jsd.claremont.edu_____

Site Name__Santa Clara River above boquet Canyon Rd._____
Did you verify that this site name is consistent with that used in previous years?
This is a section of site previously lumped as upper Santa Clara River, section 4.

Management Authority for Survey Area (circle one):

Federal Municipal/County State Tribal **Private**

Name of Management Entity or Owner (e.g., Tonto National Forest) _Newhall Land Co._____

Length of area surveyed: _2 miles_____ (specify units, e.g., miles = mi, kilometers = km, meters = m)

Did you survey the same general area during each visit to this site this year? Yes / If no, summarize in comments below.

If site was surveyed last year, did you survey the same general area this year? Yes / If no, summarize in comments below.

Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):
Native broadleaf plants
XX☐ Mixed native and exotic plants (mostly native)
(entirely or almost entirely, includes high-elevation willow)
☐ Mixed native and exotic plants (mostly exotic) ☐ Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrub species: __Cotrtonwood, Baccharis, tamarisk_____

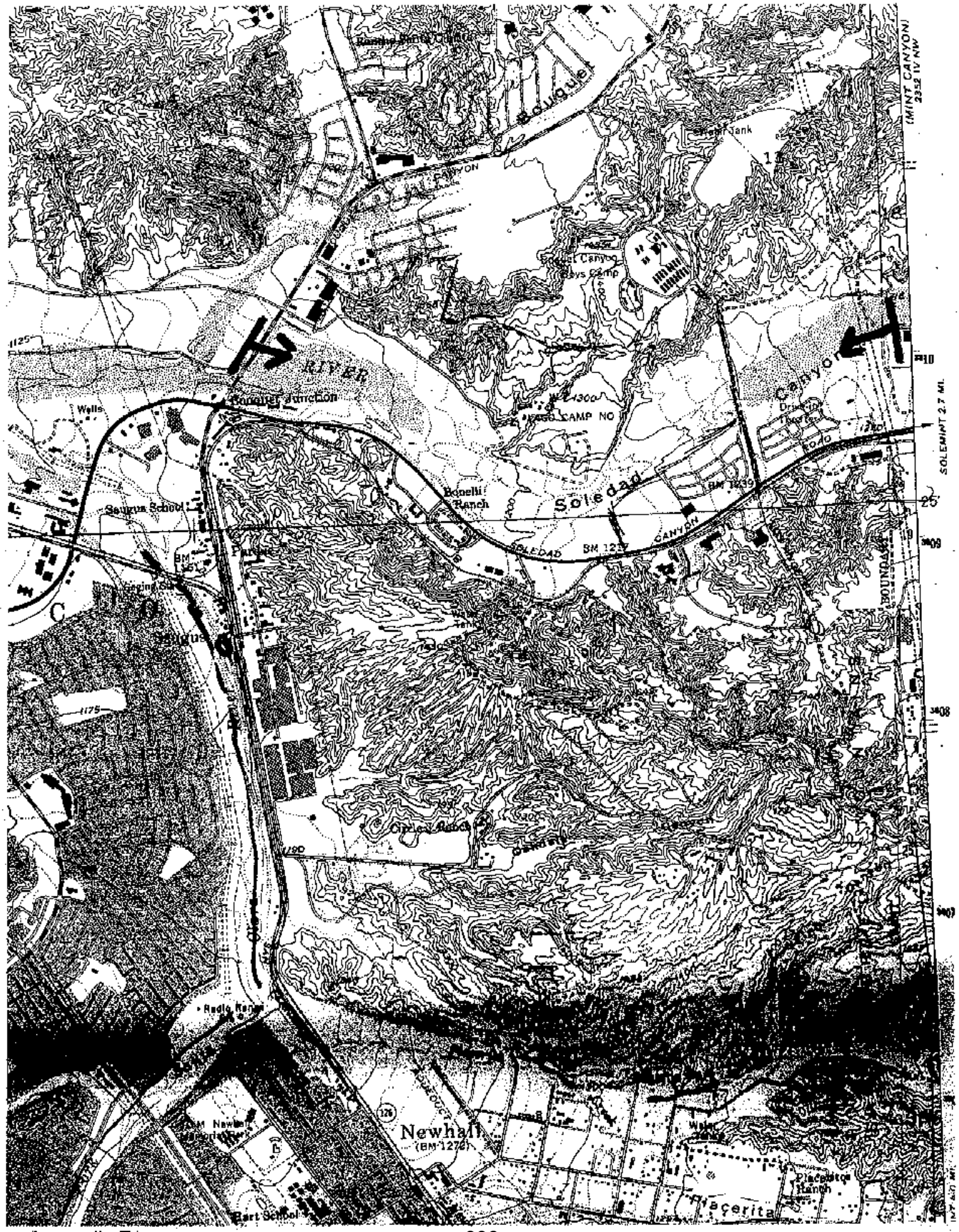
Average height of canopy: __30 ft._if present._____ (specify units)

Was surface water or saturated soil present at or adjacent to site? No .
Distance from the site to surface water or saturated soil: __water starts at downstream end of section.__ (specify units)

Did hydrological conditions change significantly among visits (did the site flood or dry out)? No (circle one)
If yes, describe in comments section below. no water present except for 50 yd section trickle in center of section.

Remember to attach a xerox copy of a USGS quad/topographical map (REQUIRED) of the survey area, noting the survey site and location of WIFL detections. You may also include a sketch or aerial photograph showing details of site location, patch shape, survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map.

Comments (attach additional sheets if necessary):_____


Bonelli Junction
Wells
Soledad
Bonelli Ranch
Soledad Canyon
Newhall
Placerita
Placerita Ranch
Radio Range
Saugus School
Saugus
Camp No
Boys Camp
Water Tank
Canyon
SOLEMINT 2.7 MI.
(MINT CANYON)
2352 IV NW

Willow Flycatcher Survey and Detection Form (rev. 4/98)

Site Name____San Francisquito Creek_____ Total Site No _____

Was site surveyed in previous year? **Yes** No Drainage Santa Clara River
If yes, what site name was used? __same as above_____
County __Los Angeles_____ State__CA____ USGS Quad Name Newhall_____

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? X☐ Yes ☐ No
Site Coordinates: Start: N__34 25/631_____ W 118 33.899_____ UTM
Stop: N__34 27.752_____ W 118 33.047_____ UTM Zone _____
Elevation _____1125-1300 ft._____ feet / meters (circle one)

***** Fill in additional site information on back of this page *****

Survey # Observer(s)	Date (m/d/y) Survey time	Number of WIFLs Found	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign Y or N	Comments about this survey (e.g., evidence of pairs or breeding, number of nests, nest contents or number of fledges seen; potential threats)
D. Guthrie _____ _____	Date 5/17 start 6:30 stop 8:30 total hrs _2.0____	0	0	0	n	n	n	
D. Guthrie _____ _____	Date 6/11 Start 6:30 Stop 8:30 total hrs _2___	0	0	0	n	n	N	
D. Guthrie _____ _____	Date 6/26 Start 6:30 Stop 8:30 total hrs _2.0__	0	0	0	n	n	N	
D. Guthrie _____ _____	Date 7/6 start 6:30 stop 8:30 total hrs 2.0	0	0	0	n	n	N	
D. Guthrie _____ _____	Date 7/17 start 6:30 stop 8:30 total hrs _2.0_	0	0	0	n	n	N	

Overall Site Summary (Total only resident WIFLs)	Adults	Pairs	Territories	Nests	Were any WIFLs color-banded? No
Total survey hrs___10.0__	0	0	0	0	If yes, report color combination(s) in the comments section on back of form

Name of Reporting Individual ____Dan Guthrie_____ Date Report Completed ___7/20/04_____

Submit the original of this form. Retain a copy for your records.

Fill in the following information completely. Submit original form. Retain copy for your records.

Name of Reporting Individual ___Dan Guthrie_____Phone # _909 607 2836_____

Affiliation __Claremont Colleges_____ Email dguthrie@jsd.claremont.edu_____

Site Name__San Francisquito Creek_____
Did you verify that this site name is consistent with that used in previous years? Yes No ? (circle one)
This is a section of site previously lumped as upper Santa Clara River
Management Authority for Survey Area (circle one):

Federal Municipal/County State Tribal **Private**

Name of Management Entity or Owner (e.g., Tonto National Forest) _Newhall Land Co._____

Length of area surveyed: _2 miles_____ (specify units, e.g., miles = mi, kilometers = km, meters = m)

Did you survey the same general area during each visit to this site this year? Yes / If no, summarize in comments below.

If site was surveyed last year, did you survey the same general area this year? Yes / If no, summarize in comments below.

Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):
Native broadleaf plants
XX☐ Mixed native and exotic plants (mostly native)
(entirely or almost entirely, includes high-elevation willow)
☐ Mixed native and exotic plants (mostly exotic) ☐ Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrub species: __Cottonwood, willow, tamarisk_____

Average height of canopy: __40 ft._____ (specify units)

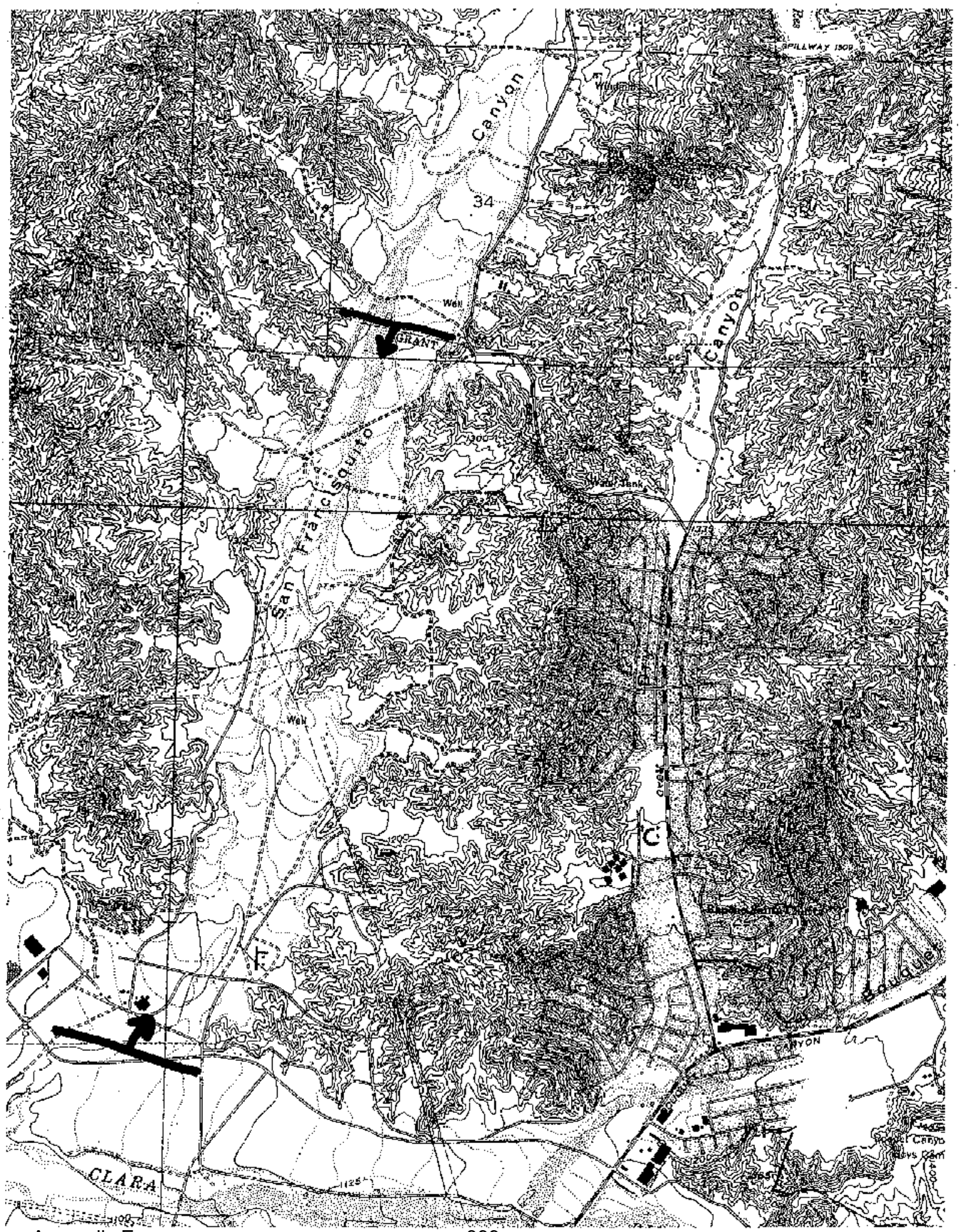
Was surface water or saturated soil present at or adjacent to site? No water present only for 50 yds in middle of section.
Distance from the site to surface water or saturated soil: _____ (specify units)

Did hydrological conditions change significantly among visits (did the site flood or dry out)? No (circle one)
If yes, describe in comments section below. no water present except for 50 yd section trickle in center of section.

Remember to attach a xerox copy of a USGS quad/topographical map (REQUIRED) of the survey area, noting the survey site and location of WIFL detections. You may also include a sketch or aerial photograph showing details of site location, patch shape, survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map.

Comments (attach additional sheets if necessary):_____

spring runoff occurred in March. There was no flowing water present during the survey period except for small area of suburban runoff in middle of section.


SPILLWAY 1508
Canyon
34
Well
GRANT
Canyon
San Francisquito
Water Tank
Well
C
F
Saugus
CANYON
CLARA
1125
1100

Willow Flycatcher Survey and Detection Form (rev. 4/98)

Site Name___South Fork_____ Total Site No _____

Was site surveyed in previous year? **Yes** Drainage Santa Clara River
If yes, what site name was used? __South Fork_____
County __Los Angeles_____ State__CA____ USGS Quad Name Newhall_____

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? X☐ *Yes* ☐ *No*
Site Coordinates: Start: N__34 23.735_____ W 118 32.354_____ UTM
Stop: N__34 25.507_____ W 118 33.710_____ UTM Zone _____
Elevation ____1120- 1200 ft._____ feet / meters (circle one)

***** Fill in additional site information on back of this page *****

Survey # Observer(s)	Date (m/d/y) Survey time	Number of WIFLs Found	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign Y or N	Comments about this survey (e.g., evidence of pairs or breeding, number of nests, nest contents or number of fledges seen; potential threats)
J. Sugden	Date 5/17 start 6:30 stop 8:30 total hrs _2.0___	0	0	0	n	Y	n	
j. Sudgden	Date 6/11 Start 6:30 Stop 8:30 total hrs _2___	1	0	0	n	Y	N	Non-singing
J. Sugden	Date 6/26 Start 6:30 Stop 8:30 total hrs _2.0__	0.	0	0	n	Y	N	
J. Sugden	Date 7/6 start 6:30 stop 8:30 total hrs 2.0	0	0	0	n	Y	N	
J. Sugden.	Date 7/17 start 6:30 stop 8:30 total hrs _2.0____	0	0	0	n	Y	N	
Overall Site Summary (Total only resident WIFLs) Total survey hrs___10.0___		Adults 1	Pairs 0	Territories 0	Nests 0	Were any WIFLs color-banded? No If yes, report color combination(s) in the comments section on back of form		

Name of Reporting Individual ____Dan Guthrie_____ Date Report Completed ___7/20/04_____

Submit the original of this form. Retain a copy for your records.

Fill in the following information completely. Submit original form. Retain copy for your records.

Name of Reporting Individual __Dan Guthrie_____Phone # _909 607 2836_____

Affiliation __Claremont Colleges_____ Email dguthrie@jsd.claremont.edu_____

Site Name__South Fork, Santa Clara River_____
Did you verify that this site name is consistent with that used in previous years? Yes No ? (circle one)
This is a section of site previously lumped as upper Santa Clara River
Management Authority for Survey Area (circle one):

Federal Municipal/County State Tribal **Private**

Name of Management Entity or Owner (e.g., Tonto National Forest) _Newhall Land Co._____

Length of area surveyed: _2 miles_____ (specify units, e.g., miles = mi, kilometers = km, meters = m)

Did you survey the same general area during each visit to this site this year? **Yes** / If no, summarize in comments below.

If site was surveyed last year, did you survey the same general area this year? **Yes** / If no, summarize in comments below.

Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):
Native broadleaf plants
XX☐ Mixed native and exotic plants (mostly native)
(entirely or almost entirely, includes high-elevation willow)
☐ Mixed native and exotic plants (mostly exotic) ☐ Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrub species: __Cottonwood, willow, tamarisk_____

Average height of canopy: __30t._____ (specify units)

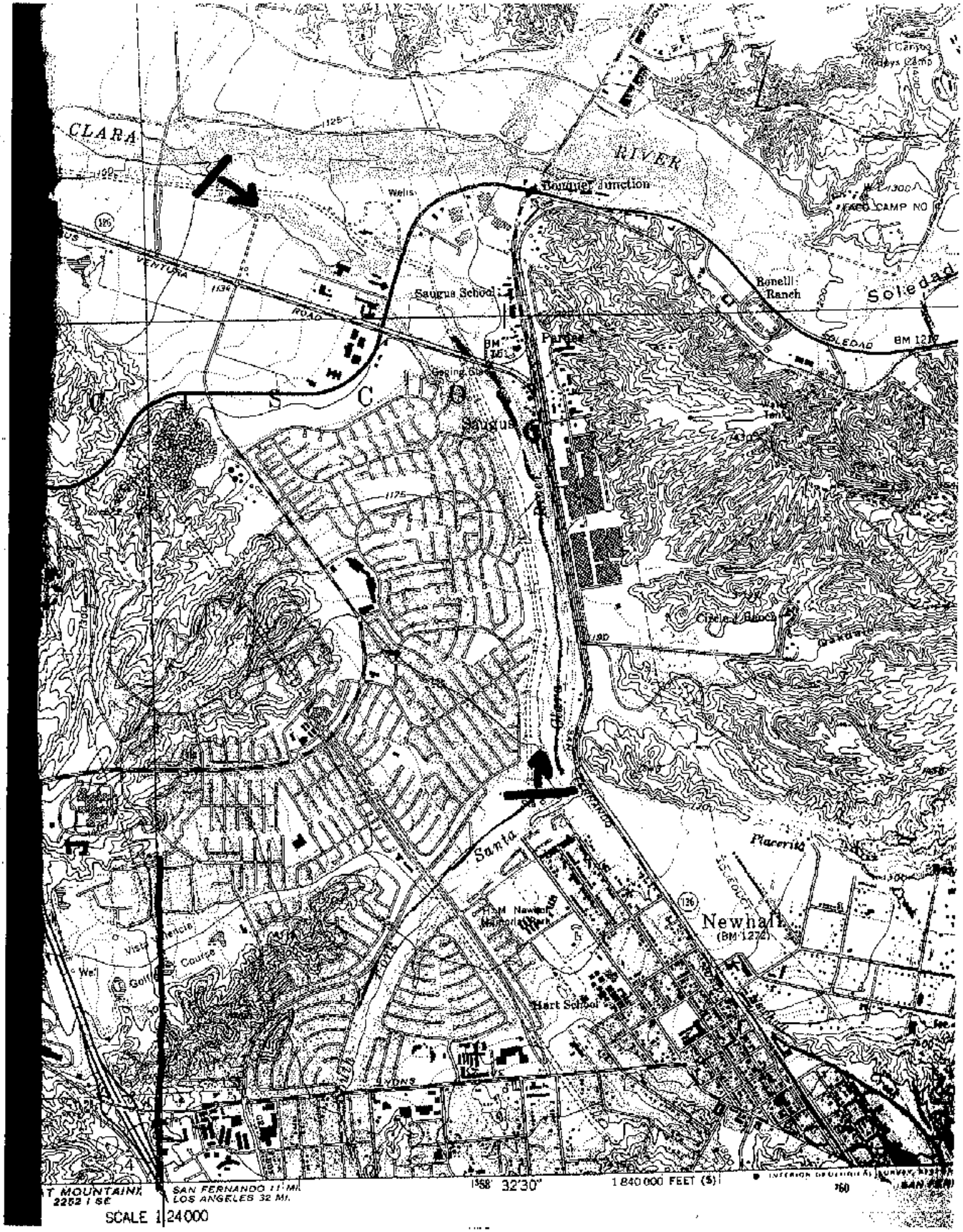
Was surface water or saturated soil present at or adjacent to site? **No** water present only in three spots due to suburban runoff.
Distance from the site to surface water or saturated soil: _____ (specify units)

Did hydrological conditions change significantly among visits (did the site flood or dry out)? No (circle one)
If yes, describe in comments section below. no water present except for 50 yd section trickle in center of section.

Remember to attach a xerox copy of a USGS quad/topographical map (REQUIRED) of the survey area, noting the survey site and location of WIFL detections. You may also include a sketch or aerial photograph showing details of site location, patch shape, survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map.

Comments (attach additional sheets if necessary):_____

No flowing water along this section. There were small puddles due to runoff from neighboring suburbs. These support stands of cottonwood where flycatcher was seen. Non singing and time of observation suggests a northern subspecies.


CLARA
RIVER
Bouquet Junction
Wells
CAMP NO
VENTURA
ROAD
Saugus School
Ronelli Ranch
Soledad
SOLEDAD
BM 1217
Perkins
Saugus
Circle J Ranch
Placerita
Santa
Newhall
(BM 1272)
Hart School
LYONS
SAN FERNANDO 11 MI.
LOS ANGELES 32 MI.
SCALE 1:24000
1 840 000 FEET (S)

Bird Observations for Spring 2004 in the Proposed Mesa East and West Development Near Valencia, California

BIRD OBSERVATIONS FOR SPRING 2004

IN THE PROPOSED MESA EAST AND WEST DEVELOPMENT

NEAR VALENCIA, CALIFORNIA

Prepared for:

Mark Subbotin
Valencia Corporation
23823 Valencia Blvd.
Valencia, Ca. 91355

Prepared by:

Daniel A. Guthrie
W.M. Keck Science Center
925 N. Mills Ave
Claremont, Ca. 91711
(909) 607-2836
dguthrie@jsd.claremont.

REVISED

August 24, 2004

Bird observations for Spring, 2004 in the proposed Mesas East and West Development near Valencia, California.

Prepared by: Daniel A. Guthrie
W.M. Keck Science Center
925 N. Mills Ave
Claremont Ca. 91711
(909) 607-2836

Nature and Scope of Surveys

During the spring and early summer of 2004 surveys were conducted within the boundaries of the proposed Mesa Projects (Figure 1). Surveys were focused on determining presence or absence of California gnatcatcher, and followed U.S. Fish and Wildlife Service Guidelines for this species. Surveys followed the protocol for non-NCCP areas, involving 6 surveys of each area, occurring between March 15 and June 30 (see Table 1 for exact dates). Each survey involved two observers and lasted about 4 hours (6:30 to 10:30 a.m.), with each observer covering an area less than 80 acres of suitable habitat.

Each survey was conducted on foot by observers well acquainted with both visual and auditory characteristics of southern California birds. Tapes of calls of California gnatcatcher were played periodically along survey routes in an attempt to elicit a response. Survey routes were designed to visit all areas within the Proposed Project Area. However, routes for regular coverage were selected through preliminary surveys and were designed to cover all areas of appropriate habitat for the focus species. Personnel for all surveys were David Crawford, Guy Bruyea and Scott Cameron, working under Federal Fish and Wildlife Service Permit numbers TE-821229-4 (Crawford), TE-837439-4 (Bruyea) and TE-808242 (Cameron), issued under section 10(a)(1)(A) of the Endangered Species Act.

Habitat Condition and Bird Observations

The Mesa Project involves an irregular area bounded on the east by Magic Mountain and on the west by a steep ridge separating the study area from the drainage of Long Canyon. On the north the area is bordered by the Santa Clara River. The southern boundary of the area is marked by cattle gates on the property boundary but not by any topographic feature (Figure 1).

The area surveyed consists of a series of canyons trending in a southeast to northwest direction and running down to the Santa Clara River. Although there is no stream flow

within these canyons, the more narrow canyons support a dry woodland of oak and sycamore which can be dense in places, forming a closed canopy over the canyon bottoms. Wider canyons have a sandy soil and support a Great Basin sage community.

Some of the mesa tops between the canyons have, at various times, been used as agricultural fields and some of these areas were under active cultivation during this study. Agriculture on the other mesas has been abandoned and these mesas now support introduced grasses and weeds, a few of the hardier coastal sage plants, and tree tobacco.

At one time the whole area, except for its westernmost portion, was an active oil field. The oil operations have been since removed and many pads and access roads plowed. These areas support grasses and non-native weeds.

Except for dry woodlands in the canyon bottoms, the whole area was probably once covered by sage scrub and chaparral communities. Today, due to cattle grazing, past agricultural activities and oil field road and pad construction, much of the area is pastureland covered with introduced grasses and weeds. Sage scrub grading into chaparral survives in dense stands on the steeper hillsides. On more gradual slopes grazing activities have broken the coastal sage community into more isolated and open patches containing many introduced grasses. Surveys concentrated on areas of sage scrub where species preferred by California gnatcatcher, California sage (*Artemesia californica*) and buckwheat (*Eriogonum sp.*) predominated and where the slope was less than 40%. (Federal Register, 2003).

The avifauna of the Mesa area (Table 1) consists of species common to the coastal sage community with mourning dove, California quail, Bewick's wren, western scrub jay, California and spotted towhee and rufous-crowned sparrow being the common species. Less abundant are species of a dry oak woodland (acorn and Nuttall's woodpecker) Swallows nesting on cliffs along the Santa Clara River were frequently observed foraging over the area. House finch, orioles and phainopepla were common in elderberry and tree tobacco. Pastureland supported lark sparrow and mourning dove.

Observations of all birds are shown in Table 1. The numbers shown are of birds seen and heard, with heard individuals forming the majority of the observations. Numbers vary between censuses for several reasons. Some censuses were not complete but, rather, were focused on particular places or areas. Also, bird activity varies with season. Different species breed at different times of the year. In general, species are most easily observed when they are actively defending territories by song during the establishment of breeding pairs. Once pairs are established and nesting begins song often decreases and the numbers of birds observed, therefore, also decreases. After young leave the nest, numbers observed increase. Thus, for most resident species, numbers of adult birds are most accurately censused in April and May, when territorial activity is at a maximum. A few species such as Anna's hummingbird that nest early in the season may be underestimated. Many species that nest in the area also migrate through the area to more northern portions of their ranges. Thus, numbers of nesting species observed in May, which include migratory birds passing through the area, do not give an accurate count of actual resident birds.

Comments on Threatened and Endangered Species

California Gnatcatcher (*Polioptila californica*)

The California Gnatcatcher is listed as a Threatened species under the Federal Endangered Species Act. Survey routes were selected to cover prime habitat for California Gnatcatcher, namely, stands of dense Coastal Sage Scrub. Surveys followed the protocol for non-NCCP areas, involving 6 surveys of each area, occurring between March 15 and June 30 (see Table 1 for exact dates). Each survey involved two observers and lasted about 4 hours (6 to 10 am), with each observer covering an area containing about 80 acres of suitable habitat. Although all areas of coastal sage scrub habitat were surveyed, particular attention was placed on more open scrub areas dominated by California sage as this type of vegetation has been shown to be preferred by gnatcatchers (Federal Register, 2003). Tapes of California gnatcatcher calls were played at regular intervals along all survey routes. No California gnatcatchers were heard or observed during this study.

Comments on Sensitive Species

Cooper's Hawk (*Accipiter cooperi*)

Cooper's hawk is considered a Species of Special Concern by the State of California. Cooper's hawks nest in woodlands along the Santa Clara River immediately north of the Mesas area. A single Cooper's hawk was observed hunting in the Mesas area on April 13.

Loggerhead Shrike (*Lanius ludovicianus*)

This is a California Special Concern species. Shrikes are resident in the sage scrub areas and one was observed in suitable nesting habitat in the study area.

Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*)

This species is considered a California Special Concern species by the Department of Fish and Game and is also a Federal Special Concern species. Rufous-crowned sparrows are a fairly common resident and breeding species in coastal sage habitat throughout the study site.

Lawrence's Goldfinch (*Carduelis canescens*)

This species, which occurs sporadically in chaparral habitat, is a highest priority species on the Audubon Birds to Watch list for 1996 and is a Bird of Management

Concern for the Fish and Wildlife Service. A single Lawrence's goldfinch was observed on April 27th.

Summary

California gnatcatcher were not observed during this study. Four Species of Concern were observed. These species, the Southern California rufous-crowned sparrow, Cooper's hawk, Lawrence's goldfinch and loggerhead shrike, are all resident in the area in low density and breed either on the site or nearby.

References

Federal Register, 2003. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*) and Determination of Distinct Vertebrate Population for the California Gnatcatcher *Polioptila californica). Vol 68, no 79 April 24, 2003, p. 20228.*

Table 1. Bird Observations on the Mesa East and West Projects, near Valencia California, 2004:

Endangered Species and Species of Concern Shaded

		Dates of Surveys					
SPECIES	**STATUS**	**3/30**	**4/13**	**4/27**	**5/4**	**5/18**	**6/9**
Turkey Vulture	s	2	0	0	5	1	3
Cooper's Hawk	r	0	0	0	0	0	0
Red-tailed Hawk	r	3	2	1	1	3	2
American Kestrel	r	0	0	0	0	1	0
California Quail	r	24	30+	30+	18	30+	30+
Killdeer	r	0	1	0	0	0	0
Rock Dove	r	2	5	0	30+	11	0
Mourning Dove	r	8	9	11	6	8	11
Greater Roadrunner	r	0	0	2	0	0	0
White-th. Swift	r	0	2	0	0	0	0
Black-chinned Hummingbird	s	0	1	0	0	0	0
Anna's Hummingbird	r	4	3	3	2	3	6
Costa's Hummingbird	s	0	0	1	0	0	0
Acorn Woodpecker	r	4	0	0	1	1	0
Nuttall's Woodpecker	r	0	0	0	1	0	0
Northern Flicker	r	1	1	1	1	0	0
Black Phoebe	r	0	2	0	0	0	0
Say's Phoebe	r	0	1	0	0	0	0
Western Kingbird	s	7	2	4	1	3	3
Loggerhead Shrike	r	0	4	0	0	0	0
Western Scrub Jay	r	19	5	8	10	5	4
American Crow	r	4	6	3	7	7	9
Common Raven	r	1	1	2	0	1	2
Violet-green Swallow	s	0	0	2	0	0	0
N. Rough-winged Swallow	s	0	4	7	1	8	8
Cliff Swallow	s	0	6	6	5	8	12
Bushtit	r	6	7	4	2	1	0
Bewick's Wren	r	11	5	6	4	8	11
Blue-gray Gnatcatcher	r	0	1	0	0	0	0
Western Bluebird	r	0	2	2	0	0	0
Wrentit	r	6	4	4	2	4	5
Northern Mockingbird	r	2	2	2	2	3	9
California Thrasher	r	5	1	1	3	1	2
European Starling	r	3	0	0	0	0	0
Phainopepla	r	0	2	0	0	2	2
Yellow-rumped Warbler	w,m	2	0	0	0	0	0
Common Yellowthroat	r	0	0	1	1	1	0
Spotted Towhee	r	30+	7	10	7	18	24
California Towhee	r	30+	11	17	12	30+	30+
Rufous-crowned Sparrow	r	0	0	0	2	0	0
Lark Sparrow	r	0	0	2	0	1	3
Savannah Sparrow	w,	0	0	2	0	0	0
Song Sparrow	r	0	0	1	0	0	0

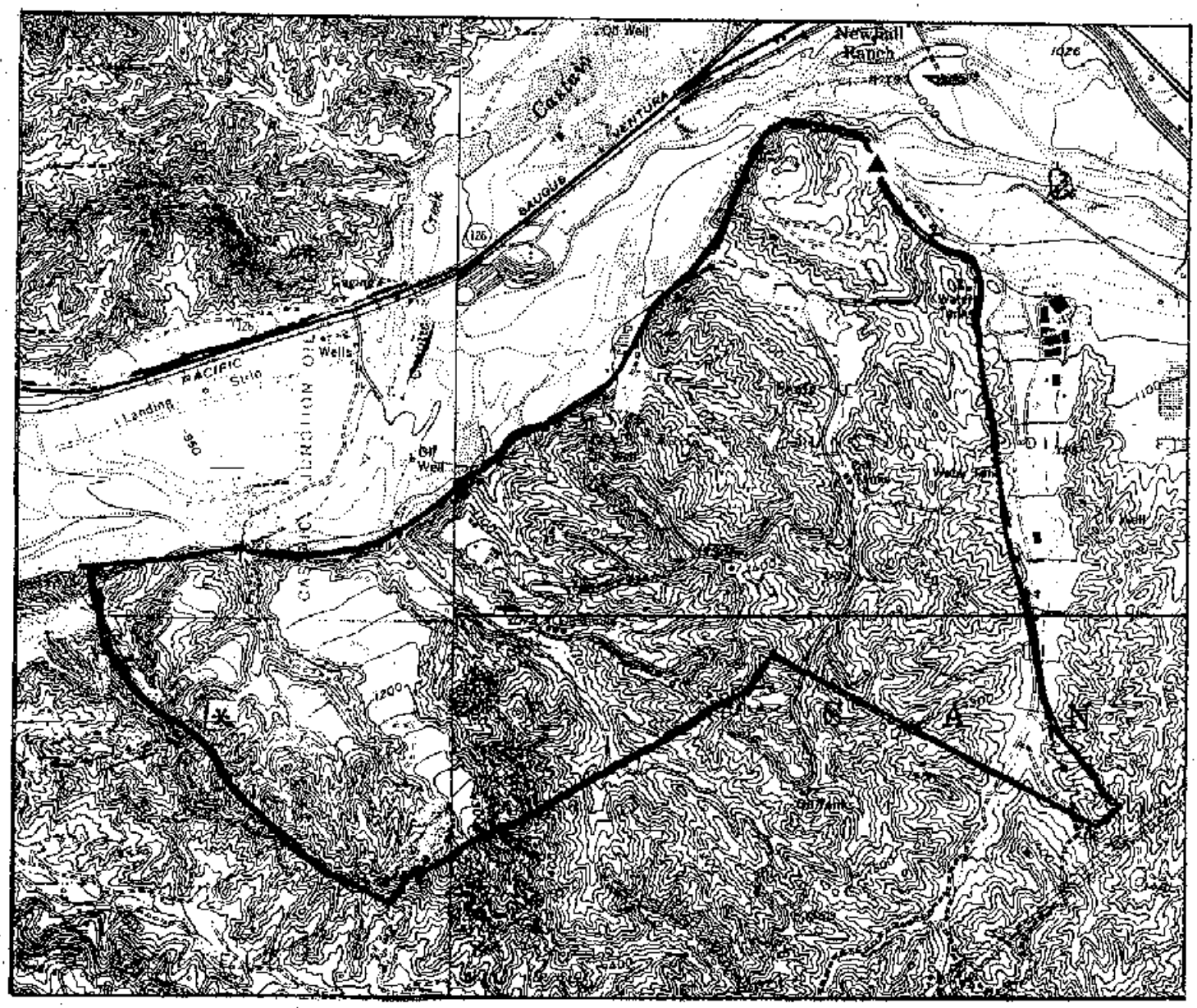
Table 1 (cont.). Bird Observations on the Mesa East and West Projects, near Valencia California, 2

		Dates of Surveys					
SPECIES	STATUS	3/30	4/13	4/27	5/4	5/18	6/9
White-crowned Sparrow	w,m	9	0	0	0	0	0
Red-winged Blackbird	s	0	4	2	1	2	1
Bullock's Oriole	s	0	0	1	1	3	3
House Finch	r	11	7	4	8	6	6
Lesser Goldfinch	r	0	1	3	0	3	0
Lawrence's Goldfinch	r	0	0	1	0	0	0

Status: m, migrant; r, resident; s, summer only; w, winter

Endangered Species and Species of Concern Shaded

Figure 1. Outline of Mesa Project, east and west.



Base Map: U.S.G.S. 7.5 minute topographic map for Newhall, 1952 and Val Verde, 1968, California, both photorevised 1988.

Bird Observations in the Proposed Magic Mountain Entertainment Project Area, Near Valencia, California, 2004

BIRD OBSERVATIONS IN THE PROPOSED MAGIC MOUNTAIN ENTERTAINMENT PROJECT AREA, NEAR VALENCIA, CALIFORNIA, 2004

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REVISED

August 24, 2004

Bird Observations in the Proposed Magic Mountain Entertainment Project Area near Valencia, California, 2004

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Nature and Scope of Surveys

During the spring and early summer of 2004 surveys were conducted within the boundaries of the proposed Magic Mountain Entertainment Project and adjacent Magic Mountain area. The area surveyed is roughly triangular in shape, bounded on the northeast by the Santa Clara River and the Old Road, on the southeast by Southern California Edison power lines, and on the west by a wide valley (Figure 1). The area includes the Six Flags Magic Mountain development (which was not surveyed) as well as undeveloped hillsides and some agricultural fields to the east and north of Magic Mountain.

Surveys were focused on determining presence or absence of California gnatcatcher, and followed U.S. Fish and Wildlife Service Guidelines for this species. Surveys followed the protocol for non-NCCP areas, involving 6 surveys of each area, occurring between March 15 and June 30 (see Table 1 for exact dates). Each survey involved two observers and lasted about 3 hours (6:30 to 9:30 a.m.), with each observer covering an area less than 80 acres of suitable habitat.

Each survey was conducted on foot by observers well acquainted with both visual and auditory characteristics of southern California birds. Tapes of calls of California gnatcatcher were played periodically along survey routes in an attempt to elicit a response. Survey routes were designed to visit all areas within the Proposed Project Area. However, routes for regular coverage were selected through preliminary surveys and were designed to cover all areas of appropriate habitat for the focus species. Personnel for all surveys were Daniel A. Guthrie and Judith A. Sugden, both working under Federal Fish and Wildlife Service Permit number TE810394-2, issued under section 10(a)(1)(A) of the Endangered Species Act.

On each survey, numbers of all species observed were noted and, in addition to the gnatcatcher, special attention was placed on locating species considered rare and endangered or of Special Concern, and on determining numbers of raptoral birds. Table 1 presents all observations during these surveys.

Habitat Condition and Bird Observations.

Immediately north of the Magic Mountain parking lots are agricultural fields that were actively cultivated during the study period. East of Magic Mountain are planted grassy mesas that have been cleared of most native vegetation and that were cut for hay in late June. The only trees in the study area are a few solitary oaks that dot this section and planted introduced trees within and along the edges of the Magic Mountain development and its main entrance. South of Magic Mountain is an area of native habitat. Hillsides are sage scrub, grading into chaparral in some of the deeper valleys. Wide valleys within the site contain deep sandy soil and support Great Basin sage as well as introduced tree tobacco. A portion of the hills just north of Magic Mountain were burned recently and supported mainly introduced grasses.

The avifauna (see Table 1) is dominated by sage scrub species, with mourning dove, California quail, Bewick's wren, California towhee, and rufous-crowned sparrow being the common species. Grassy areas support mourning dove and lark sparrow. Elderberry bushes in the area attracted orioles, mockingbird and phainopepla and numerous tree tobacco was attractive to orioles and hummingbirds. Food waste at Magic Mountain provided some attraction to starlings, house finch and ravens and trees around this developed area provided nest sites for orioles.

Observations of all birds are shown in Table 1. The numbers shown are of birds seen and heard, with heard individuals forming the majority of the observations. Numbers vary between censuses for several reasons. Some censuses were not complete but, rather, were focused on particular places or areas. Also, bird activity varies with season. Different species breed at different times of the year. In general, species are most easily observed when they are actively defending territories by song during the establishment of breeding pairs. Once pairs are established and nesting begins song often decreases and the numbers of birds observed, therefore, also decreases. After young leave the nest, numbers observed increase. Thus, for most resident species, numbers of adult birds are most accurately censused in April and May, when territorial activity is at a maximum. A few species such as Anna's hummingbird that nest early in the season may be underestimated. Many species that nest in the area also migrate through the area to more northern portions of their ranges. Thus, numbers of nesting species observed in May, which include migratory birds passing through the area, do not give an accurate count of actual resident birds.

Comments on Threatened and Endangered Species

California Gnatcatcher (*Polioptila californica*)

The California Gnatcatcher was listed as a Threatened species under the Federal Endangered Species Act in 1993. Preferred habitat includes various sage scrub communities, often dominated by California sage (*Artemesia californica*) and buckwheat (*Eriogonum sp.*) California gnatcatchers generally avoid nesting in areas with a slope of greater that 40% (Federal Register, 2003)

Survey routes were selected to cover prime habitat for California Gnatcatcher, namely, stands of dense Sage Scrub in canyon bottoms and on north facing hillsides. During all surveys no California gnatcatchers were heard or observed.

Comments on Sensitive Species

Raptors

The study site contained few suitable trees and no suitable cliffs for nesting. The only raptor nest found was of a red-tailed hawk (Figure 1) which nested on a telephone pole at the edge of the site.

Although the site contained few suitable trees or cliffs for nesting, several red-tailed hawks and a white-tailed kite regularly hunted on the site . Although no owls were seen on the site, barn owls and great horned owls regularly foraged on neighboring areas and can be expected to forage over this site as well.

White-tailed Kite (*Elanus leucurus*)

This species, formerly the black-shouldered kite, is considered a Species of Special Concern by the State of California. Kites nest in the riparian forest along the Santa Clara River and a single individual regularly hunted over the grassy sections of this area.

Loggerhead Shrike (*Lanius ludovicianus*)

This is a California Species of Special Concern. Shrikes are resident in the sage scrub and one pair, regularly observed, in the study area, probably nested just west of the property.

Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*)

This species is considered a California Special Concern species by the Department of Fish and Game and a Species of Concern by the Fish and Wildlife Service. Rufous-crowned sparrows are a fairly common resident and breeding species in denser sections of sage scrub habitat throughout the study site.

Summary

No California gnatcatcher, were observed on the site. Birds of the site are those typical of dry coastal sage scrub habitat and two of the observed species which probably nest on or near the site, loggerhead shrike and Southern California rufous-crowned sparrow, are considered Species of Concern. A third species of concern, the white-tailed kite, nests in riparian woodland along the Santa Clara River and regularly hunted over the area.

References

Federal Register, 2003. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*) and Determination of Distinct Vertebrate Population for the California Gnatcatcher *Polioptila californica). Vol 68, no 79 April 24, 2003, p. 20228.*

Table 1. Birds Observations on the Magic Entertainment Project Area, 2004

Endangered Species and Species of Concern Shaded

		Dates of Surveys					
SPECIES	**STATUS**	**23-Mar**	**28-Apr**	**11-May**	**2-Jun**	**15-Jun**	**28-Jun**
Turkey Vulture	s	5	0	3	0	1	1
White-tailed Kite	r	4	1	0	4	4	0
Red-tailed Hawk	r	0	1	2(2)	5	2	2
American Kestrel	r	0	0	0	0	0	1
California Quail	r	24	55	46	74	135	132
Killdeer	r	0	0	0	4	0	0
Mourning Dove	r	18	10	0	80	39	35
Greater Roadrunner	r	0	0	0	1	0	1
White-th. Swift	r	0	0	4	0	0	0
Black-chinned Hummingbird	s	0	0	0	2	2	6
Anna's Hummingbird	r	1	0	2	15	7	16
Costa's Hummingbird	s	0	0	0	0	0	6
Allen's Hummingbird	r,m	0	0	0	0	1	5
Nuttall's Woodpecker	r	0	0	0	0	0	1
Black Phoebe	r	0	0	0	0	1	1
Say's Phoebe	r	1	0	0	3	0	2
Ash-throated Flycatcher	s	0	0	0	8	2	0
Western Kingbird	s	0	0	0	9	9	4
Loggerhead Shrike	r	1	2	2	2	1	3
Western Scrub Jay	r	2	8	4	17	5	14
American Crow	r	0	1	0	2	0	2
Common Raven	r	4	2	2	13	27	10
Tree Swallow	s	4	0	0	0	0	0
Violet-green Swallow	s	0	0	0	0	3	0
N. Rough-winged Swallow	s	2	6	6	12	16	2
Cliff Swallow	s	0	0	0	6	5	0
Barn Swallow	s	0	0	0	0	2	0
Bushtit	r	0	0	0	2	0	2
Bewick's Wren	r	0	10	4	12	29	4
Blue-gray Gnatcatcher	r	0	0	0	2	0	0
Western Bluebird	r	0	0	0	0	0	4
American Robin	r	0	0	0	0	2	0
Wrentit	r	6	3	2	7	20	2
Northern Mockingbird	r	4	6	6	12	19	11
California Thrasher	r	2	1	0	0	0	2
European Starling	r	0	0	0	0	2	0
Phainopepla	r	0	0	6	6	5	9
Orange-crowned Warbler	w,m	0	0	0	2	0	0
Common Yellowthroat	r	0	1	0	0	0	0
Wilson's Warbler	m	0	0	1	0	0	0
Spotted Towhee	r	3	4	8	37	19	0

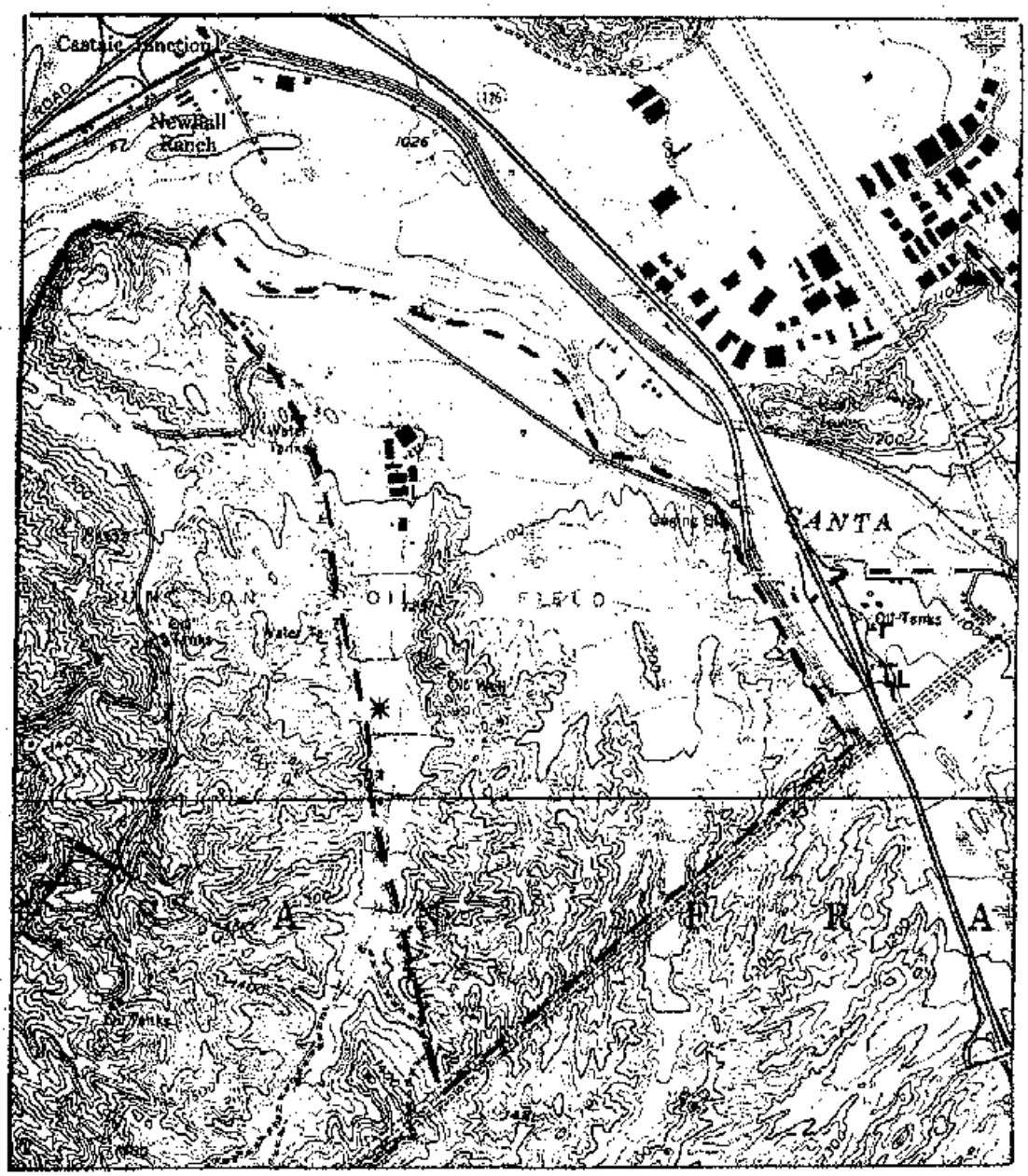
Table 1 (cont.). Birds Observations on the Magic Entertainment Project Area, 2004

Endangered Species and Species of Concern Shaded

				Dates of Surveys			
SPECIES	**STATUS**	**23-Mar**	**28-Apr**	**11-May**	**2-Jun**	**15-Jun**	**28-Jun**
California Towhee	r	8	26	24	48	61	37
Botteri's Sparrow	r	0	0	0	0	5	0
Lark Sparrow	r	0	0	6	12	13	3
Black-headed Grosbeak	s	0	2	0	6	1	2
Lazuli Bunting	s	0	0	2	2	0	1
Red-winged Blackbird	s	0	80	0	0	0	0
Brewer's Blackbird	r	0	25	0	0	0	0
Hooded Oriole	s	0	0	0	3	0	0
Bullock's Oriole	s	0	10	0	14	10	4
House Finch	r	32	14	46	160	91	225
Lesser Goldfinch	r	0	0	4	14	33	9
House Sparrow	r	0	0	0	0	5	5

Status: m, migrant; r, resident; s, summer only; w, winter

Figure 1. Map of the proposed Magic Mountain Entertainment Project Area study site near Valencia, California



- - - - - **Approximate boundary of survey area.**

✳ - Red- tailed hawk nest

Base Map: U.S.G.S. 7.5 Minute topographic map for Newhall, California, 1952, photorevised 1988.

Impact Sciences, Results of Focused Surveys for Arroyo Toad and Special-Status Aquatic Reptiles and Amphibians

Results of Focused Surveys for Arroyo Toad and Special-Status Aquatic Reptiles and Amphibians Newhall Ranch, Valencia, California

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May 21, 2002

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Results of Focused Surveys for Arroyo Toad and Special-Status Aquatic Reptiles and Amphibians Newhall Ranch Valencia, California

The following presents the findings of focused protocol surveys that were conducted to determine the presence / absence of the federally-listed Endangered arroyo toad (*Bufo californicus*) within portions of the Santa Clara River in Los Angeles County that comprise the Newhall Ranch Specific Plan area. This report is intended to provide project specific biological information to Newhall Ranch Company, U.S. Army Corps of Engineers (ACOE) and U.S. Fish and Wildlife Service (FWS) regarding results of focused surveys for arroyo toad and additional special-status amphibians and aquatic reptiles including southwestern pond turtle (*Clemmys marmorata pallida* – herein SPT) and two-striped garter snake (*Thamnophis hammondi* – herein TGS) conducted on the subject site.

INTRODUCTION

The Newhall Ranch Specific Plan survey reach is located in north Los Angeles County (Figure 1). Surveys were conducted in potentially suitable habitat in portions of the Santa Clara River from near the confluence with Castaic Creek, west (downstream) approximately four (4) miles to the Los Angeles County border (Figure 2). The survey area is situated within the Val Verde, California U.S. Geological Survey (USGS) 7.5-minute quadrangle map.

General Arroyo Toad Background

The arroyo toad is a small (generally 2 to 3 inches in snout to vent length), light greenish gray or tan toad with warty skin and dark spots. Its underside is white or buff colored without spots. A light-colored stripe crosses the head and eyelids, and a light area usually occurs on each sacral hump and in the middle of the back (FWS, 1994). The arroyo toad does not have the prominent white dorsal stripe characteristic of the western toad (*Bufo boreas*).

The arroyo toad was listed as a federally Endangered species by the Service on December 16, 1994 (50 CFR Part 17). The arroyo toad is also considered a Species of Special Concern by the California Department of Fish and Game and a Protected Amphibian under the state Fish and Game Code. A federal Recovery Plan was prepared in 1999 and critical habitat was defined in February 2001. Much of the information in the federal listing documents (FWS 1994, 1999, 2001a) regarding the biology of the

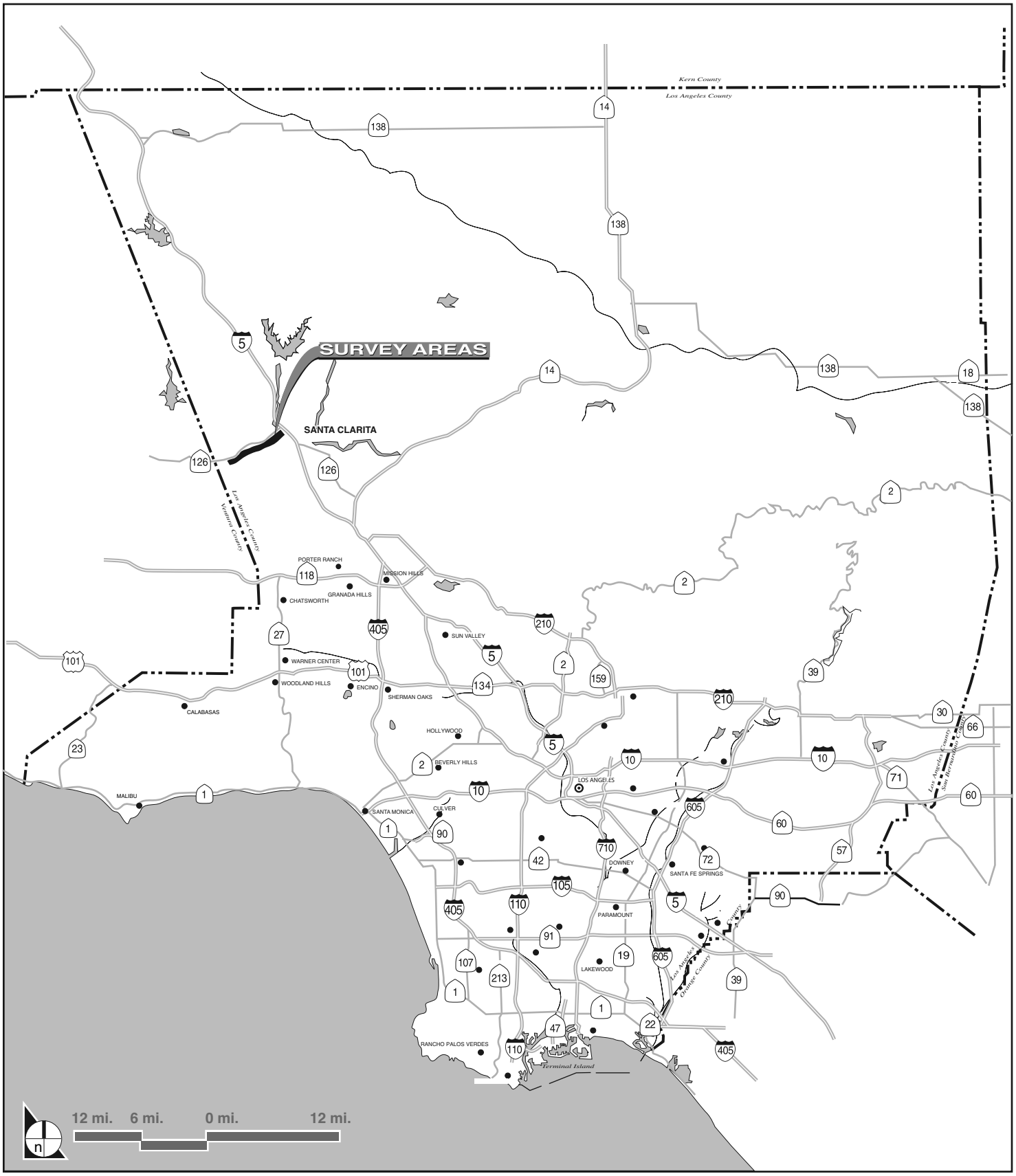
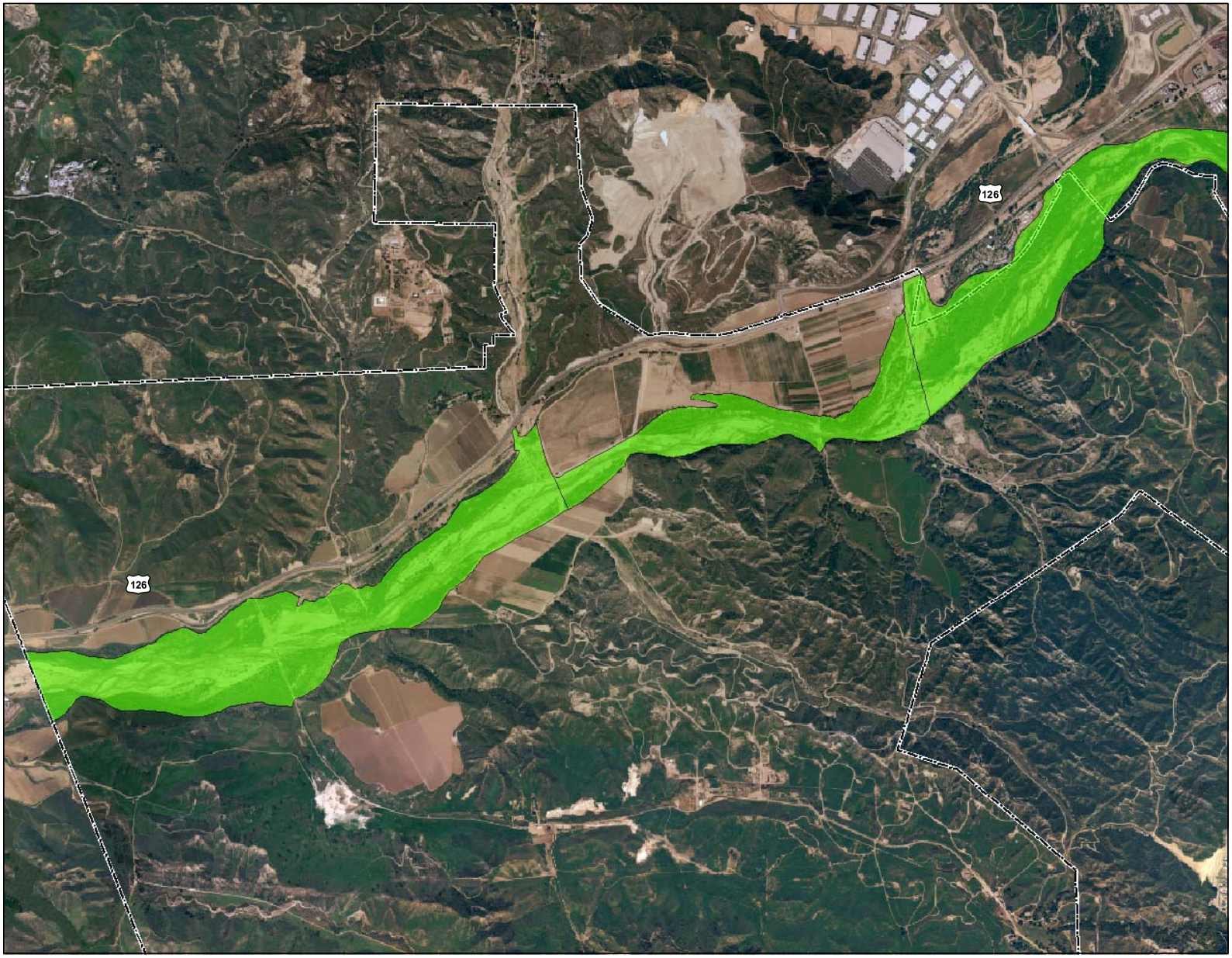


FIGURE 1

Regional Location

32-53•05/02

ARROYO TOAD SURVEY

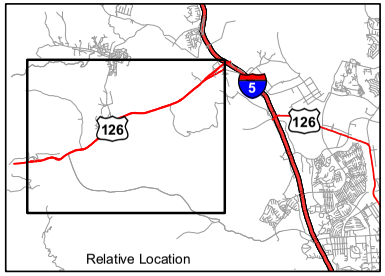


Arroyo Toad Report

L E G E N D

Arroyo Toad Survey Reach

Newhall Ranch
Specific Plan Boundary



N

0 750 1,500 3,000 Feet

0 125 250 500 Meters

FORMA

03-22-02
surv-rch_nh1_2_fig2.mxd

Figure 2

SURVEY REACH

arroyo toad was derived from extensive research conducted by Dr. Samuel Sweet of the University of California, Santa Barbara (Sweet 1992, 1993). Additional detail is included in the Recovery Plan (FWS 1999) and a radio telemetry study conducted by Ruben Ramirez (2000).

Although considered a subspecies by some taxonomists, the nearest population of the arroyo toad's closest relatives is the Colorado River basin. Based on the separation from the other subspecies and results from recent genetic tests, it has been recommended that the arroyo toad be considered a separate species (FWS 2001a). For this reason, many biologists refer to arroyo toad as *Bufo californicus* and is, therefore, considered as such in this report.

Arroyo toad historically ranged from the upper Salinas River, south through the Santa Ynez, Santa Clara, and Los Angeles River basins and the coastal drainages of Orange, Riverside, and San Diego Counties to the Arroyo San Simeon system into Baja California, Mexico (FWS 1999). As of 1994 arroyo toad was known from only 22 populations (Ramirez 2000). Many areas that may have historically contained suitable breeding habitat for arroyo toad have been degraded by dam and flood control construction, off-road recreation, urbanization, mining, and introduced predators (FWS, 1999). This species is currently found in relatively small, isolated populations. Most remaining populations of arroyo toad occur on privately owned lands. Less than 50 percent of the known extant populations of arroyo toad occur on the Los Padres, San Bernardino, and Cleveland National Forests (FWS, 1994).

Overview of Arroyo Toad Habitat Characteristics

In general, arroyo toad requires habitat features that occur in drainages of a narrow, intermediate range of size that have a sufficient number of tributaries to produce an amount of alluvium necessary to decrease the gradient and form suitable breeding pools (Sweet 1992). Dr. Sweet's research in the Los Padres National Forest also suggests that "The late breeding season and long periods of dependence on surface water of arroyo toad larvae and juveniles restrict them from occurring in areas where the riverbed dries out by early summer (1992)."

Habitats utilized by arroyo toad include both breeding sites and over-wintering sites. Suitable breeding habitat features include shallow pools with a minimum of vegetation along one or both margins during the breeding season (Sweet 1992). Preferred pools occur adjacent to sand bars and sandy, stream terraces with vegetation that is mature enough to stabilize the terrace soils during all but the largest storm events. Eggs are deposited and larvae develop in shallow pools with minimal current, little or no emergent vegetation, and a sand or pea gravel substrate overlain with silt (FWS, 1994). As described by Sweet (1992), the following characteristics are relatively consistent with documented

breeding pools: proximity to sandy terrace habitat; minimal current; the majority of the pool is less than 30 cm deep; substrate is sand, gravel, or pebbles; a gently sloping shoreline, or central sand bar; and bordering vegetation is low or set back such that most of the pool is open to the sky.

After metamorphosis (usually in June and July), juvenile toads commonly remain on the bordering gravel bars until the pool dries up (often between 3 and 8 weeks) (Sweet 1992). Juvenile and adult frogs feed on insects on sandy stream terraces with a sparse understory at ground level and a light to moderate overstory of riparian trees, including cottonwoods (*Populus* sp.), oaks (*Quercus* sp.), or willows (*Salix* sp.). Adult toads excavate shallow burrows on the terraces for shelter during the day when the surface is still damp or for longer intervals during the dry season (FWS, 1994).

Adult arroyo toad extensively utilize terraces and marginal zones (areas of mixed sediments that occur between the stream channel and mature riparian vegetation zone) outside the breeding season "and seem to have a critical dependence on terrace habitat in the late fall and winter months, when they are generally inactive" (Sweet 1992). Terraces utilized occur in the vicinity of breeding sites and are commonly characterized by sparse to moderate vegetation including mule fat (*Baccharis salicifolia*), California sycamore (*Platanus racemosa*), cottonwoods (*Populus* spp.), willow (*Salix* spp.), and coast live oak (*Quercus agrifolia*). The understory in these habitats may be bare or consist of scattered grasses herbs, and leaf litter (FWS 2001a). In order for any of these habitats to be suitable for arroyo toad use, several areas of open friable sand must be present where they can burrow (FWS 2001a).

Adult arroyo toads have also been documented in upland habitats outside of a stream channel, primarily outside of the breeding season. These 'uplands' are generally associated with accessible upper flood terraces that occur in the vicinity of breeding habitat. Upland habitats utilized by over-wintering arroyo toad include alluvial scrub, coastal sage scrub, chaparral, grassland and oak woodland (FWS 2001a). Soils are also important in these over-wintering habitats. Though individual arroyo toad have been documented from small mammal burrows, the majority of data suggests that they prefer sandy soils in which to burrow (Bloom, personal communication). Data collected by Ramirez (2000) suggest that arroyo toad may move burrow sites to follow soil moisture levels. Some arroyo toad have been documented to move back into the stream channel itself during the driest part of the season.

There is some variation in the timing of arroyo toad breeding based upon location and environmental conditions, but it generally takes place between February and late June. In the region that includes the subject survey area, breeding generally occurs between April and June. Adult males will select a breeding site generally based on the criteria described above, but may call from a variety of positions within the pools including the margins, edges of central bars, submerged bars, or occasionally from the

surface of dense submerged vegetation (Sweet 1992). During courtship, males vocalize a high trill usually lasting 8 to 10 seconds (FWS 1999).

Critical Habitat Designation

Critical habitat is defined by the USFWS as: (1) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Endangered Species Act of 1973 as amended, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures that are necessary to bring an endangered or a threatened species to the point at which listing under the Act is no longer necessary (USFWS, 2001).

Criteria used by FWS to select critical habitat includes evaluation of an area to determine the presence of 'primary constituent elements,' as defined at 50 CFG 424.12(b) (FWS 2001a). These elements include physical and biological features that are essential to the conservation of the species, and that may require special management and protection (FWS 2001a). Primary constituent elements for the arroyo toad include aquatic breeding habitats and non-breeding upland habitats. These elements are discussed by Sweet (1992, 1993) and are specifically outlined in the Final Rule and include:

- A hydrologic regime that supplies sufficient flowing water of suitable quality and sufficient quantity to sustain eggs, tadpoles, metamorphosing juveniles, and adult breeding toads;
- Low-gradient stream segments (typically less than 4 percent) with sandy or fine gravel substrates which support the formation of shallow pools and sparsely vegetated sand and gravel bars for breeding and rearing of tadpoles and juveniles;
- A natural flooding regime or one sufficiently corresponding to a natural regime that will periodically scour riparian vegetation, rework stream channels and terraces, and redistribute sands and sediments, such that adequate numbers and sizes of breeding pools and sufficient terrace habitats with appropriate vegetation are maintained;
- Upland habitats (particularly alluvial streamside terraces and adjacent valley bottomlands that include areas of loose soil and dependable subsurface moisture where toads can burrow underground and avoid desiccation) of sufficient width and quality to provide foraging and living areas for subadult and adult arroyo toads;
- Few or no nonnative species that prey upon or compete with arroyo toads, or degrade their habitat;
- No manmade barriers that completely or substantially impede migration to over-wintering sites, dispersal between populations, or recolonization of areas that contain suitable habitat;
- Limited human-related disturbance.

It should be noted, and is discussed in the Final Rule that arroyo toad are not distributed uniformly throughout the designated critical habitat areas and that breeding and upland habitats are patchily distributed (FWS 2001a). The nature of breeding habitats is dynamic and may shift in structure and location from year to year depending upon seasonal rainfall and storm cycles. Similarly upland habitats, though more stable, can be affected by fire, storms, and other natural events.

Determination of whether an area was critical to the conservation of arroyo toad was accomplished by determining if an area 1) supports a substantial core population; 2) supports at least a small arroyo toad population and possesses favorable habitat conditions for population expansion and persistence; 3) suitable habitat situated in a location that appears to be crucial for maintaining the viability of a larger metapopulation; 4) occupied habitat on the periphery of the arroyo toad's geographic range; and 5) occupied habitat in atypical or underrepresented ecological environments (e.g., high elevation or desert-edge populations (FWS 2001a).

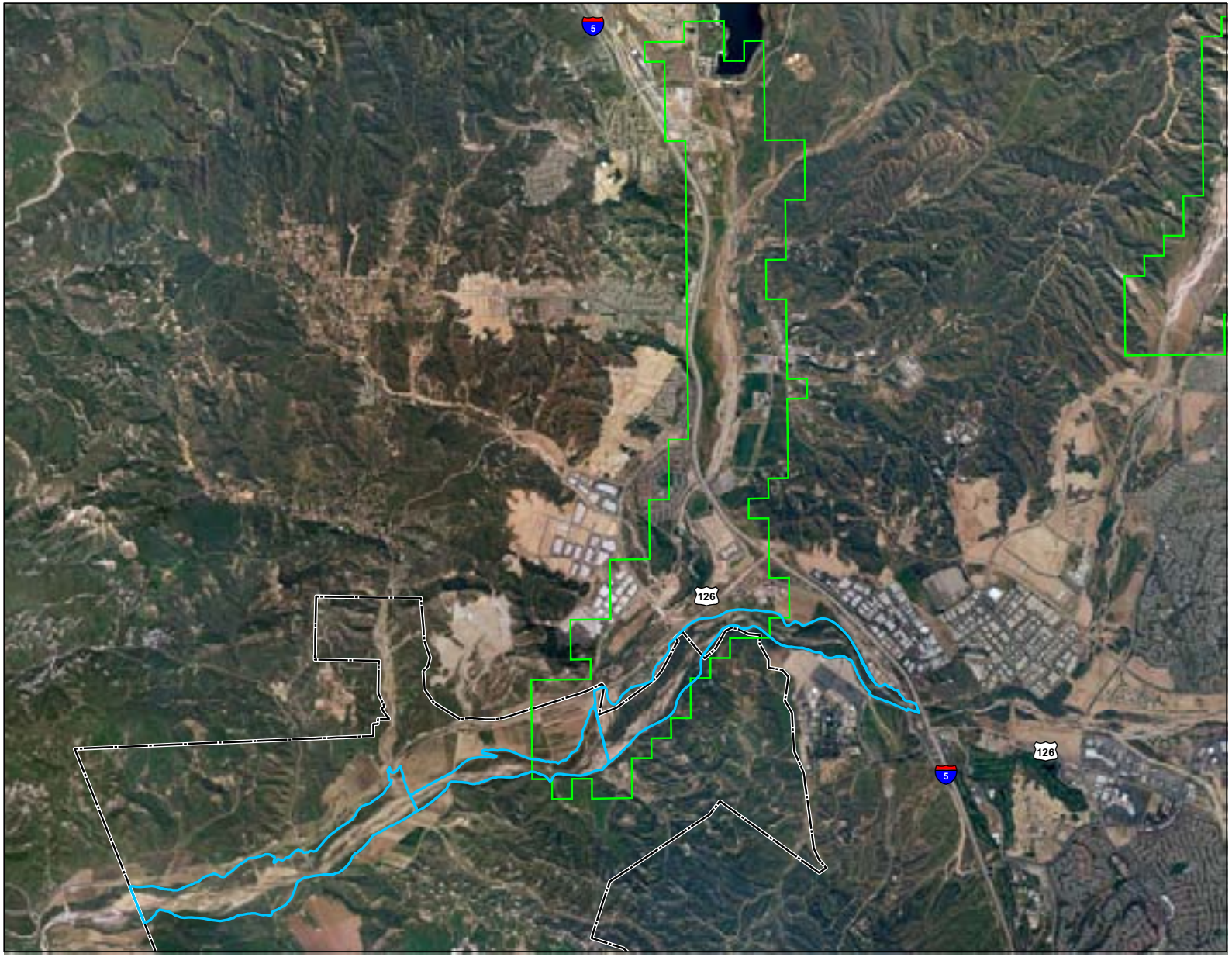
In order to preserve as much of the ecological and geographic diversity of arroyo toad distribution, three recovery units were selected. These are referred to as the Northern, Southern, and Desert recovery units. These units are based on ecological and geographic separation and the known and historic range of the species. The Service's goal is to stabilize and expand the populations in these units in order to preserve the species' genetic diversity as well as the environments in which the species is found (FWS 1999). The recovery units are based on the U.S. Geological Survey hydrologic subregion and accounting unit boundaries as delineated on the Hydrologic Unit Map. The objective of the recovery plan is to initially recover the arroyo toad sufficiently to warrant reclassification to Threatened status and finally to recover the species sufficiently to warrant delisting altogether (FWS 2001a).

USFWS has identified 22 critical habitat units for the recovery of the arroyo toad. The unit nearest to Newhall Ranch is Unit 6, the Upper Santa Clara River Basin, which consists of portions of Castaic and San Francisquito Creeks, the Santa Clara River, and adjacent uplands, encompassing approximately 8,305 acres (**Figure 3**). Arroyo toads have been recorded at the following locations within critical habitat Unit 6, upstream of the subject Newhall Ranch survey area.

- Castaic Creek – both above and below the reservoir – occurrences documented on Department of Water Resources land and the Angeles National Forest both above and below the Castaic Lake reservoir (FWS 1999, FWS 2001a)

- Upper San Francisquito Creek – recent surveys (presumably on Forest Service land) "found evidence of the species" in this drainage within the designated critical habitat area (FWS 2001a).

- Santa Clara River – 2000 CNDDB report of 6 arroyo toad tadpoles observed by Dr. Lou Courtois in the river adjacent to Castaic Junction site.



Arroyo Toad Report

L E G E N D

- Arroyo Toad Critical Habitat
- Arroyo Toad Survey Reach
- Newhall Ranch Specific Plan Boundary

N

0 1,750 3,500 7,000 Feet

0 300 600 1,200 Meters

FORMA

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crithab_newhall1_2_fig3.mxd

Figure 3

CRITICAL HABITAT (UNIT 6)

The FWS (2001a) considers the Santa Clara River to be essential as a dispersal corridor for arroyo toads between Castaic Creek and upper San Francisquito Creek. FWS (2001a) believes the stability of the Upper Santa Clara River basin arroyo toad population will increase substantially with appropriate management of non-native plants and animals and habitat rehabilitation. These activities are already underway in the lower San Francisquito Creek area and include removal of giant cane and tamarisk from the streambed and supplemental plantings of willows and cottonwoods.

METHODOLOGY

Previous Studies In and Near the Newhall Ranch Project Area

Documentation pertinent to the biological resources in the vicinity of the site was reviewed and analyzed. Information reviewed included: (1) the Federal Register listing package for the federally listed Endangered arroyo toad potentially occurring on the project site; (2) literature pertaining to habitat requirements of sensitive species potentially occurring on the project site; (3) the California Natural Diversity Data Base (CNDDB 2001) information regarding special-status species potentially occurring on the project site for the Newhall, Val Verde, and Mint Canyon USGS 7.5-minute quadrangle maps, and (4) previous surveys for aquatic resources in the Newhall Ranch project area. A summary of the results are provided below.

- Federal Register – The December 16, 1994 Determination of Endangered Status for the Arroyo Southwestern Toad (50 CFG Part 17, RIN 1018-AB97) cited arroyo toad locations from Sespe and Piru Creeks and the Los Padres National Forest (FWS 1994). There were no records of any arroyo toad in the Newhall Ranch area mentioned in this report.

- The February 7, 2001 Final Designation of Critical Habitat for the Arroyo Toad; Final Rule (50 CFR Part 17, Vol. 66, No. 26), stated that arroyo toad have been reported from Castaic Creek above and below the reservoir and from San Francisquito Creek between the southern end of Section 34 and Bee Canyon. There were no records of any arroyo toad in the Newhall Ranch area mentioned in this report (FWS 2001a).

- Rare Plant and Animal Survey, Santa Clarita Water District Service Area (San Marino Environmental Associates, 1995) – Non-protocol reconnaissance surveys were conducted in the NMRP area, but the species was not observed. However, the author states that it could be present in low numbers.

- Sensitive Aquatic Species Survey for Newhall Land & Farming Company (San Marino Environmental Associates, 1995) – Non-protocol reconnaissance surveys were conducted of the Santa Clara River from Bouquet Canyon to Castaic Creek, and along San Francisquito. None were found.

- Newhall Ranch Biota Report (RECON, 1995) – Non-protocol surveys were conducted on the Santa Clara River for the Newhall Ranch Specific Plan EIR prepared by Los Angeles County. None were seen during the surveys, but there is a moderate potential for their occurrence on the main stem in Newhall Ranch.

- Survey for Arroyo Toad for Newhall Ranch (RECON, 1999) – Protocol surveys were conducted, but no toads were observed. However, appropriate habitat is present.

- Biota Report for SEATAC for West and East Creek Projects on San Francisquito Creek (Impact Sciences, 1998) – Report states that the species may travel periodically to project area from upstream population; cited Frank Hovore's report of anuran (frog or toad) eggs observed in the project area, but washed away by stream flows before an accurate identification could be made.

- Surveys on Tesoro del Valle (White and Leatherman Bioservices, 2001) – Arroyo toad habitat assessment for the Tesoro del Valle project located on San Francisquito Creek, immediately north of the NRMP project area. The assessment focused on the Tesoro project area, as well as approximately 9 linear miles of San Francisquito Creek habitat, north from its confluence with the Santa Clara River. The evaluation was based on the presence or absence of primary constituent habitat elements. The report concluded that the most critical primary constituent element is a hydrologic regime that supports habitat for breeding adults, eggs, tadpoles, and metamorphosing juveniles (Leatherman, 2000). As such, it was determined that the best potential habitat for the arroyo toad in San Francisquito Creek occurs north of the Tesoro del Valle project site on the National Forest. The report further stated that though the project area and other portions of San Francisquito Creek south of U.S. Forest Service lands supported many of the primary constituent elements, the hydrologic regime was not present. Therefore, it was concluded that this portion of San Francisquito Creek would only be useful for dispersing individuals if they were to occur in the immediate area.

- Sandburg Reconnaissance Surveys, NRMP project area – In April 2001, Ms. Nancy Sandburg conducted surveys in the Santa Clara River on Newhall Land and Farming property. In notes sent to the USFWS, Ms. Sandburg reported observations of a total of four adult toads from several survey efforts. Each was detected in the Santa Clara River in the near vicinity of the San Francisquito Creek confluence. A single adult was observed at night on April 18 and three adults were reported as observed in the same general vicinity on the following week although their exact location is unknown. Ms. Sandburg's notes did not include detection of any vocalizations or any other breeding behavior.

- Sandburg Reconnaissance Surveys, Soledad Canyon area – In May 2001, Ms. Sandburg conducted arroyo toad surveys in the Santa Clara River in the Soledad Canyon area. Arroyo toad tadpoles (three separate cohorts) were reported from three separate drying pools within the project reach which includes the portion of the Santa Clara River occurring between the River's End vacation park and the proposed Transit Mix Concrete company mine. This site is situated approximately 9 miles east of the NRMP. Ms. Sandburg noted that there was a potential for some of the tadpoles to be lost before metamorphosis due to the rapid evaporation of the remaining water in the pools (Sandburg 2001).

- Impact Sciences, Inc. protocol surveys in NRMP area, portions of Castaic Creek, San Francisquito Creek from the Santa Clara River to the Copper Hill Bridge, and the Santa Clara River east from the NRMP area to approximately 500 meters past the Los Angeles Aqueduct crossing, including portions of South Fork Santa Clara River and Bouquet Creek – In spring 2001 intensive surveys following FWS recommended survey protocol were conducted in the described area. A single arroyo toad was observed in the Santa Clara River adjacent to the San Francisquito Creek confluence.

Survey Scope and Methods

USFWS developed a survey protocol to determine the presence or absence of arroyo toad (FWS 2001b; see **Appendix A**). The protocol requires six focused surveys be conducted in suitable habitat between March 15 and July 1 with at least seven days between surveys. The surveys were timed such that at least one survey is conducted during the months of April, May, and June. Surveys should include both daytime and nighttime components conducted within the same 24-hour period. The surveys should not be conducted during adverse weather conditions because environmental conditions such as low temperatures, high winds, and rain may affect the behavior of arroyo toad. Full moon phases should also be avoided.

Impact Sciences conducted protocol surveys for arroyo toad beginning April 19, 2001 on approximately 4.0 total miles of the Santa Clara River. Surveyors included Impact Sciences Senior Biologist David Crawford, Mr. Scott Cameron of Ecological Sciences, Inc., Mr. Pete Bloom and Ms. Chris Neimela. Both Mr. Cameron and Mr. Bloom hold current FWS Section 10(a)(1)(A) Endangered Species Recovery permits to survey and handle this species. Ms. Neimela is named as an authorized assistant on Mr. Bloom's permit. Mr. Crawford has also had considerable experience surveying, trapping, and relocating arroyo toads with both Mr. Cameron and Mr. Bloom.

The primary purpose of the survey effort was to determine presence/absence of arroyo toad within the Newhall Ranch area. As such, pursuant to protocol, if and when any arroyo toads were observed or detected, surveys would cease in those specific areas. Surveys were continued in areas adjacent to observed toads in order to accurately map the specific locations of all occupied areas within the entire survey reach.

In order to cover the entire survey reach following FWS survey guidelines, the Newhall Ranch area was divided into two separate survey zones such that each zone could be fully evaluated by two biologists during a single survey effort. The limits of each survey zone are described as follows:

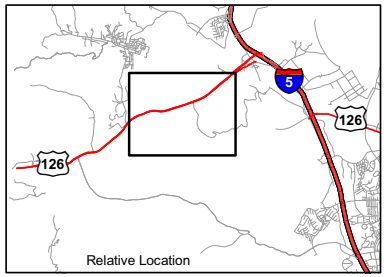
- **Newhall Ranch 1 (Survey Zone 1)** – The portion of the Santa Clara River that occurs between the confluence of Castaic Creek and the Chiquito Canyon crossing (**Figure 4a**). Six (6) focused surveys were conducted in this zone on April 19, May 1, May 21, June 7, June 14, and June 21, 2001.
- **Newhall Ranch 2 (Survey Zone 2)** – The portion of the Santa Clara River extending west from the Chiquito Canyon crossing to the Ventura County border (**Figure 4b**). Six (6) focused surveys were conducted in this zone on April 19, May 2, May 14, May 29, June 13, and June 20, 2001.

Arroyo Toad Report

L E G E N D

Arroyo Toad Survey Reach

Newhall Ranch
Specific Plan Boundary



N

Feet
1000

Meters
300

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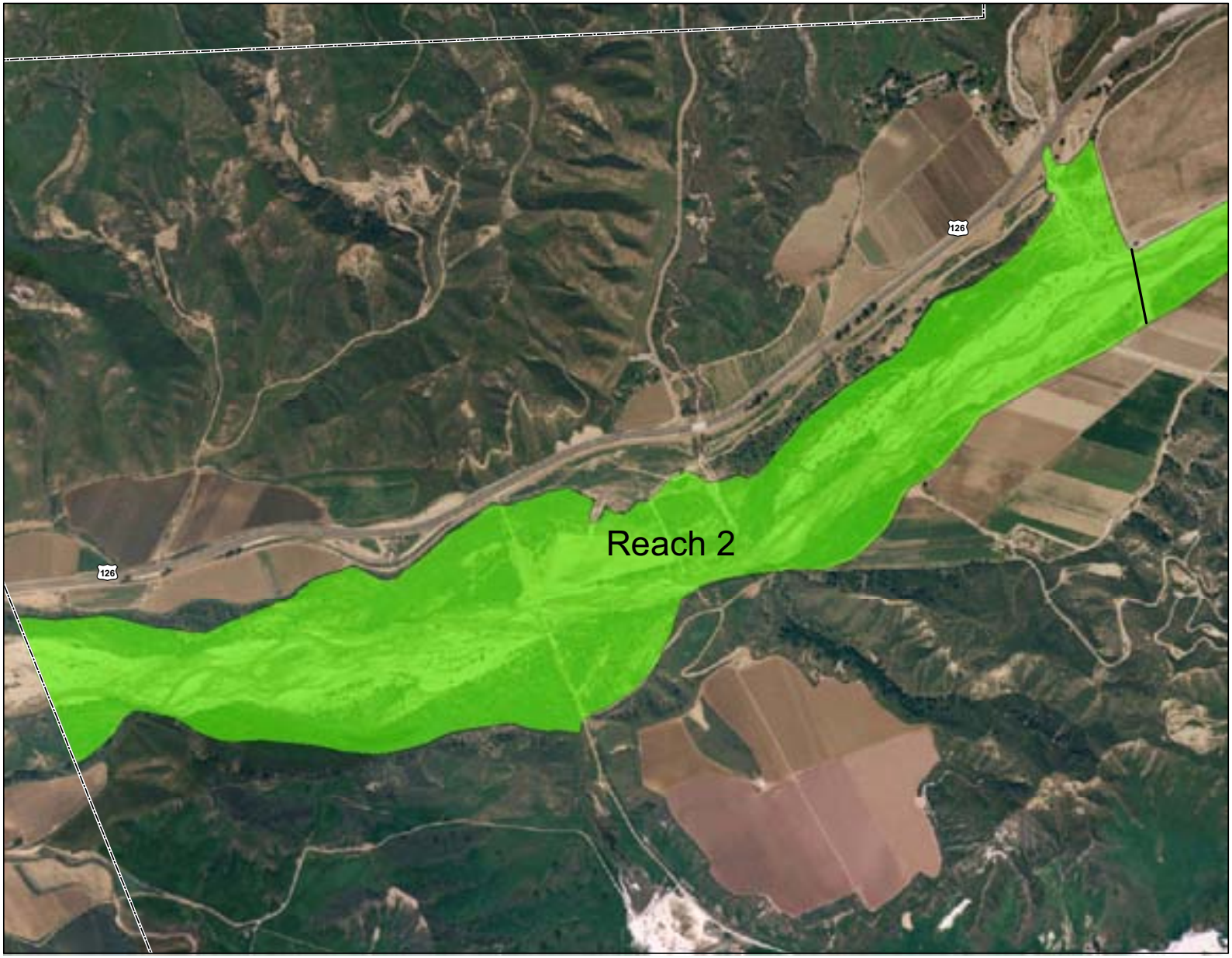
Figure 4a

NEWHALL RANCH
SURVEY REACH ZONE 1

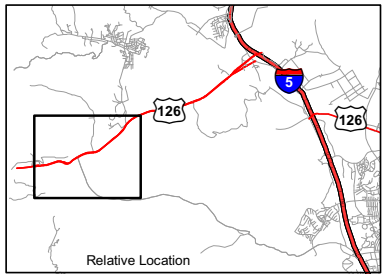


Arroyo Toad Report

L E G E N D

Arroyo Toad Survey Reach

Newhall Ranch
Specific Plan Boundary



N

Feet
0 250 500 1,000

Meters
0 75 150 300

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surv-rch_nh2_fig4b.mxd

Figure 4b

NEWHALL RANCH
SURVEY REACH ZONE 2

Pursuant to protocol methodologies (see **Appendix A**), a series of six day and night surveys (conducted within the same 24-hour period) were conducted at least seven days apart. Additionally, at least one survey was conducted in each of the months of April, May, and June. Each survey zone was systematically surveyed by at least two biologists at a time. Daytime surveys consisted of identifying suitable breeding pools to determine if egg masses, tadpoles, or metamorphosing juveniles were present, and for the purpose of identifying the most likely calling sites for any adult males that were potentially in the area. All nighttime surveys were conducted when air temperatures were at least 55 degrees Fahrenheit when they were initiated. Periods of full moon phases were generally avoided. Surveys were conducted each night from about 2030 to 0000 hours.

Weather conditions were generally calm and clear throughout the survey effort with a few nights of relatively overcast conditions. Each zone was surveyed by walking slowly and carefully along stream banks or within the stream itself when necessary. As with the daytime surveys, every precaution was taken not to disturb or create silt deposits within potential breeding pools, and care was taken not to disturb or injure potentially occurring arroyo toad adults, juveniles, tadpoles, or egg masses. Periodic stops were taken to listen for calling males at 15-minute intervals or as appropriate depending upon individual zone conditions. Survey were conducted as quietly as possible to maximize the potential to hear calling arroyo toads. Handheld flashlights and headlamps were utilized to visually locate toads within potential breeding areas and along stream banks. In addition to documenting arroyo toad data, all aquatic herpetofauna observed during both day and night surveys were recorded.

Additionally, Mr. Crawford and Mr. Cameron conducted two visits to an area known to be occupied by arroyo toad to determine if and when adult males were calling and what stages of development larval tadpoles would be in. The area surveyed was a portion of Castaic Creek that is situated approximately one mile north of the Castaic reservoir on U.S. Forest Service land.

During both visits, arroyo toad tadpoles were observed in relatively large numbers, but no adults were observed. This is likely based on the timing of the visits which occurred in early and mid-June when adult are likely to have returned to burrow sites. Mr. Pete Bloom, who also participated in the survey effort, was concurrently monitoring arroyo toad population activity on Camp Pendleton in San Diego County. Though it is understood that there is some variation in the timing of life history events between San Diego and Los Angeles County, the information was useful in calculating whether adults would be calling and when tadpoles began metamorphosing.

Following the completion of the protocol surveys, upland habitats adjacent to the river and creek channels were examined to determine their suitability for use as dispersal and over-wintering habitat.

Key elements indicating suitability include soils, connectivity, vegetation, slope, barriers, and land use.

PROTOCOL SURVEY RESULTS

No arroyo toads were observed or detected in the Newhall Ranch survey area and daytime surveys did not reveal the presence of any egg masses or larvae and no juvenile or adult toads were observed or otherwise detected. In addition, no available survey data indicates that the arroyo toad has been recently recorded within the Newhall Ranch survey areas.

Though no arroyo toads were recorded, other amphibian and aquatic reptile species were detected. All life stages of western toad (*Bufo boreas*), Pacific chorus frog (*Pseudacris regilla*), California chorus frog (*Pseudacris cadaverina*), were recorded. An interesting note is that no bullfrogs (*Rana catesbeiana*) were detected during the entire survey effort. Several two-stripe garter snake (*Thamnophis hammondii*) and southwestern pond turtle (*Clemmys marmorata pallida*), both California protected species and state species of special concern, were also detected throughout the survey effort. Locations of these special-status species are also illustrated on **Figure 5**.

Most of the habitat covered by protocol surveys was considered to be of relatively high quality as most or all of the primary constituent elements of arroyo toad habitat were present. Habitat in the area included sparsely vegetated sandbars with gravelly to sandy substrates. As described, small clumps of giant cane were present as were scattered willow saplings, and non-native tamarisk (*Tamarix* sp.). The outer terraces that exist along the base of the north and south banks, supported patches of larger cottonwoods and willows, and other areas more dominated by mule fat. The vegetation in these areas was often very dense and included willows, cottonwoods, and dense patches of cattails. Existing agricultural uses characterize much of the adjacent uplands though some undeveloped areas are still present. Habitat characteristics for each survey zone were relatively similar throughout each reach of the two reaches that comprise the Newhall Ranch survey area.

HABITAT EVALUATION

Most of the habitat (within the river channel) covered by protocol surveys within the Newhall Ranch area was considered to be of relatively high quality as most or all of the primary constituent elements of arroyo toad habitat were present.

Arroyo Toad Report

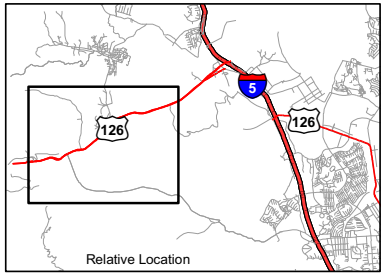
L E G E N D

Arroyo Toad Survey Reach

Newhall Ranch
Specific Plan Boundary

Southwestern Pond Turtle.

Two-Striped Garter Snake



N

0 750 1,500 3,000 Feet

0 125 250 500 Meters

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Figure 5

Special - Status Species Locations

An additional habitat evaluation was conducted following completion of the protocol presence/absence surveys with the goal of more fully understanding the extent of arroyo toad habitat suitability within the Newhall Ranch area. As protocol surveys were primarily conducted in aquatic habitat, these additional evaluations were focused on upland habitat adjacent to the selected protocol survey zones. Methods used in the upland habitat evaluations included a combination of analyzing recent aerial photographs, USGS topographic maps, and USDA Soil Service maps, and then verifying preliminary conclusions in the field. As part of this evaluation, we attempted to delineate areas of high, medium, and low habitat quality based on the presence or absence of the primary constituent elements.

The primary constituent elements, by definition, are all required in order to support a sustainable population of arroyo toad. As such, only those areas that supported all of these habitat characteristics were considered to be of high quality. Habitat areas that supported most of the elements (lacking one or possibly two depending upon all environmental factors) were considered to be of moderate quality, and those areas missing two or more elements (especially where hydrologic regime was absent) were considered to be of low value as arroyo toad habitat.

Most data reported to date suggests that non-breeding and over-wintering adult arroyo toads will move to sandy terraces that support marginal zones and a variety of vegetation including cottonwood or oak woodlands, sage or saltbush scrub, and chaparral. The Final Rule for Critical Habitat cites results from a 1998 study by Paul Griffin and Ted Case that indicate average maximum movements perpendicularly from a streambed were approximately 240 feet for male arroyo toads and 443 feet for females. A maximum movement record of 984 feet was also cited in this study (FWS 2001a). The Recovery Plan cites data from one study suggesting perpendicular movement from 1580 to nearly 6350 feet. Another study in San Diego County involving upland pitfall trapping cited in the Final Rule for Critical Habitat indicated perpendicular movements ranging from 46 feet to nearly 3,600 feet. These latter two studies were conducted in San Diego County in drainages that are considerably broader and flatter than those found in the NRMP area, and are also subject to very different climatic conditions. The radio telemetry study by Ruben Ramirez (2000) reported upland terrace dispersal up to 121 feet at Little Rock Creek and up to 656 feet at Horsethief Canyon, which are both situated on the north side of the Transverse Ranges; an area more geographically and climatically similar to the Newhall Ranch area. Ramirez (2000) concluded that dispersal distance from breeding habitats to upland habitats are expected to be less in drier habitats than in moister areas. Factors which may be contributing to the decreased upland movement include limited rainfall, limited availability of late season surface water, reduction of soil moisture as distance to creek increases, and reduced shrub cover, which likely increases evaporation from upland soils (Ramirez 2000). Ramirez (2000) also notes that in the Transverse

Ranges, tall cliff faces (>60 degrees) and steep canyon slopes represent barriers to the movement of this species.

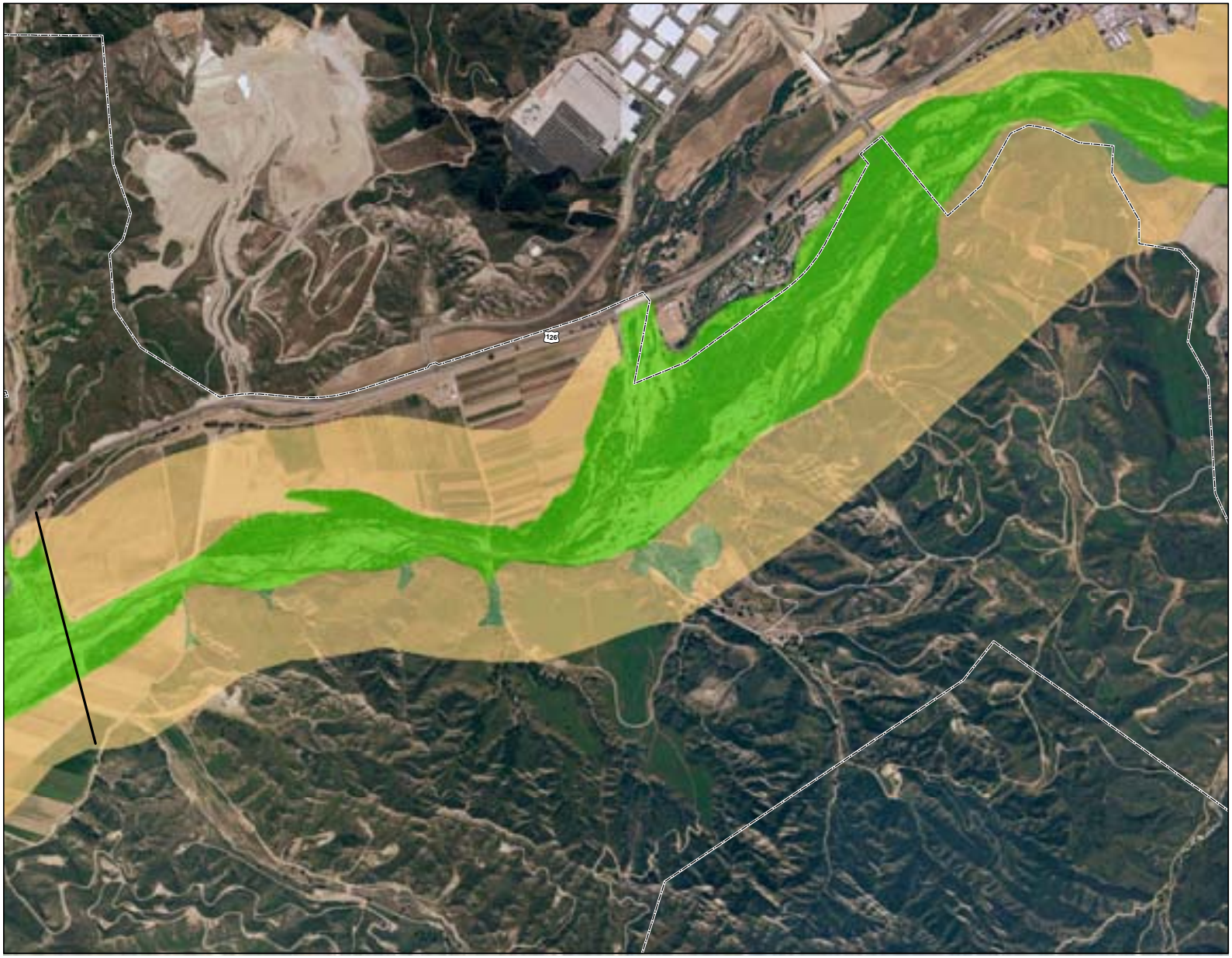
In the process of evaluating Critical Habitat for arroyo toad, the FWS determined that areas up to 80 feet in elevation above the stream channel were most likely to contain the primary constituent upland habitat elements (FWS 2001a). They utilized a 250-meter grid (conforming to a Universal Transverse Mercator [UTM] grid) to map the habitat areas. This method successfully included most documented occurrences and approximately 88 percent of the upland pit fall trapping study captures. This method minimized inclusion of existing development into designated Critical Habitat boundaries. However, some developed areas are still illustrated as occurring within Critical Habitat boundaries and the Final Rule specifically states: "Federal actions limited to these areas would not trigger a Section 7 consultation, unless they affect the species and/or the primary constituent elements in adjacent critical habitat" (FWS 2001a).

For the purposes of this evaluation, each habitat zone corresponds to the protocol survey zones previously described and also includes all upland habitat occurring within approximately 1,640 feet of either side of the outward boundaries of the protocol survey areas as illustrated. This limit was selected based on the literature regarding adult arroyo toad upland dispersal perpendicular to breeding habitats. Habitat quality can vary considerable throughout a survey zone and obviously boundaries do not occur in straight lines. However, for the purpose of illustration, areas evaluated are depicted in zones of existing development and low, moderate, and high quality habitats. Zones illustrated were conservatively delineated in favor of the higher grade of habitat. The following provides a description of the results of the habitat evaluation by survey zone.

Newhall Ranch Reach 1 (Figure 6a)

Within the Riverbanks

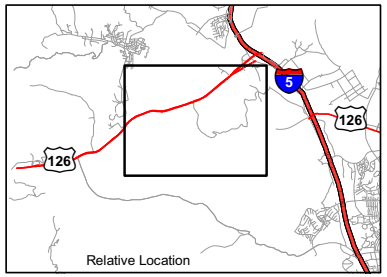
This reach supports a diverse mosaic of riparian and wetland habitats within the river channel, including open water, barren sandbars, and various densities of riparian scrub and woodland. Reach 1 supports multiple small channels that range from shallow open and braided to relatively deep (>1 meter) and under dense vegetative cover. Several sand bars and sandy/gravelly terraces are present between the stream banks. The channel ranges in width between its banks from approximately 400 feet to 1,600 feet. Perennial flow results from tertiary treated water released from the Los Angeles County Sanitation Districts' Water Reclamation Plant (No. 32) upstream of the reach, as well as from the upstream plant (No. 26).



Arroyo Toad Report

L E G E N D

- High Quality Habtiat
- Moderate Quality Habtiat
- Low Quality Habtiat
- Newhall Ranch Specific Plan Boundary



N

0 250 500 1,000 Feet

0 75 150 300 Meters

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Figure 6a

NEWHALL RANCH HABITAT EVALUATION ZONE 1

All of the primary constituent elements for arroyo toad habitat are present along most of this reach within the riverbanks. For example, there is sufficient water to sustain the life cycle of arroyo toad within the river channel as evidenced by the large numbers of western toad and chorus frog eggs, larvae, juveniles, and adults which were observed. Additionally, this portion of the river is of sufficiently low gradient and supports patches of sandy and fine gravel substrates. The primary source of water in this portion of the river are from upstream water reclamation plants, and at times, temporary releases from Castaic dam. During these temporary water releases, water flow immediately downstream of the Castaic Creek confluence (along the northern river channel) resulted in very high flow rates and was not conducive to the establishment of potential breeding pools. Overall, the stream bottom throughout the reach is characterized as sandy to gravelly with little accumulated silt. Braided, open low-flow channels, sandbars, and sparsely vegetated terraces are present in this zone. This zone supports areas characteristic of a sufficiently low gradient to support potential breeding pools. The reach is also subject to a natural flooding regime that will periodically scour riparian vegetation, rework stream channels and terraces, and redistribute sands and sediments, such that adequate numbers and sizes of breeding pools and sufficient terrace habitats with appropriate vegetation are maintained.

There are upland terraces within the river channel that could support over-wintering adult arroyo toad in this portion of the Newhall Ranch survey area. These terraces consist of sandy to gravelly soils with densities of vegetation varying from bare to dense, increasing with distance from the channel. Dominant vegetation includes willows, mule fat, cottonwood, arrow weed and patches of non-native giant cane and tamarisk. Terraces within the river channel are subject to major storm events that have the potential to scour the entire area between the banks, which could ultimately result in the loss or displacement of any arroyo toad present in the reach at the time. However, the presence of some mature willows and cottonwoods suggest that the ground may be stable enough to withstand such storm events.

No non-native predators were observed within this reach, although non-native fish, African clawed frogs, and bullfrogs are known from nearby portions of the Santa Clara River and Castaic Creek.

Outside of the Riverbanks

There are no manmade barriers present in this reach that could completely or substantially impede upland movement of arroyo toads. However, it should be noted that many stretches of stream bank in this zone are near vertical and of a height that would significantly impede migration out of the stream channel.

Most of the upper terraces and foothill slopes (beyond the stream banks) are highly disturbed from long-standing agricultural uses. Both the north and south sides of the river support areas of active agriculture. In fact, nearly all of the upland habitat present along the northern channel bank is currently under agricultural production. However, there are areas of upland habitat along the southern channel boundaries that have been designated as moderate quality due to the presence of sage scrub vegetation and absence of agriculture, although many upland areas present along the south bank are inaccessible due to the height and near vertical angle of the bank. Some of these upland areas support habitat features conducive to arroyo toad occupation, but there are only a few small areas where access would not be constrained due to the presence of dense vegetation and/or height and steepness of adjacent banks.

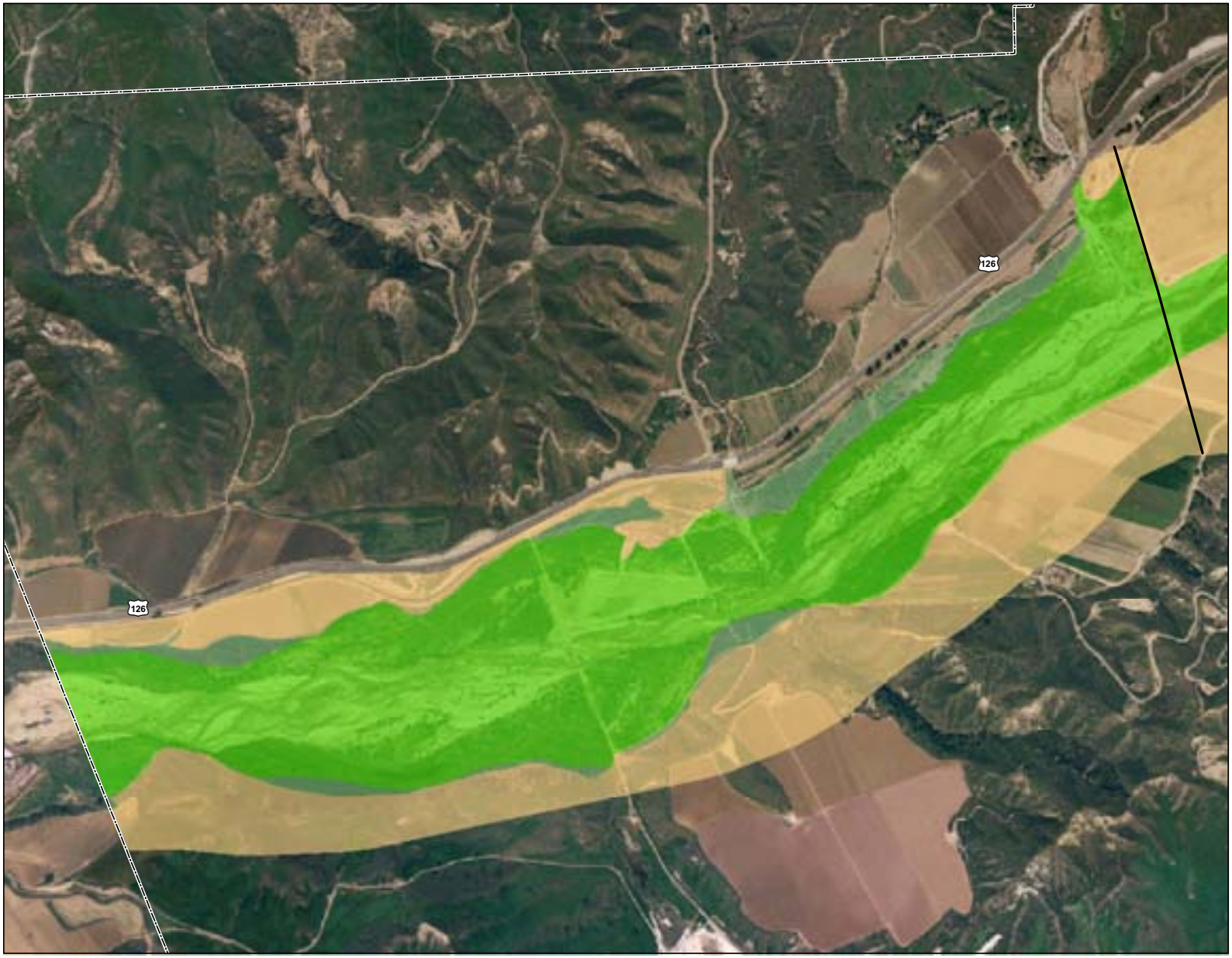
Conclusion

Newhall Ranch Reach 1 supports a mosaic of habitat types and qualities. Though most of the high quality habitat occurs between the banks, there are some areas of moderate quality upland terrace habitat associated with this portion of the Santa Clara River, primarily located above the southern riverbank where native sage scrub vegetation is present. However, most of the adjacent uplands consist primarily of agricultural fields, which are considered to be of low quality as most of these areas are difficult to access and they do not support habitat characteristics suitable for survival of over-wintering arroyo toads. As previously discussed, arroyo toads are periodically found in agricultural fields. However, due to the nature of land practices (i.e., tilling, disking, and pesticide use) it is expected that mortality rates in these areas exceed reproduction rates (FWS 2001a). No arroyo toads were found in agricultural fields during the subject survey. As such it is appropriate to consider these areas of low value as habitat for arroyo toads. The small areas that do support suitable upland habitat are characterized as moderate quality habitat, because overall, they would still be difficult for arroyo toads to access. As such, the best opportunities for over-wintering toad would be inside the stream banks where soil types are suitable and soil moisture is higher.

Newhall Ranch Reach 2 (Figure 6b)

Within the Riverbanks

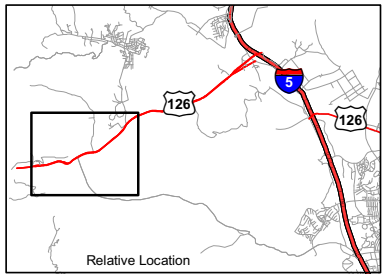
This reach contains high quality habitat in the river channel, between riverbanks. The river exhibits a considerable diversity of sandbars, terraces, and riparian woodlands combined with shallow low-flow pools that have suitable substrate for the various life stages of the arroyo toad. The stream channel width ranges from approximately 400 feet to nearly 2,000 feet.



Arroyo Toad Report

L E G E N D

- High Quality Habtiat
- Moderate Quality Habtiat
- Low Quality Habtiat
- Newhall Ranch Specific Plan Boundary



N

0 250 500 1,000 Feet

0 75 150 300 Meters

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newhall2_habeval.mxd

Figure 6b

NEWHALL RANCH HABITAT EVALUATION ZONE 2

All of the primary constituent elements for arroyo toad habitat are present along most of this reach within the riverbanks. For example, there is sufficient water to sustain the life cycle of arroyo toad within the river channel as evidenced by the large numbers of western toad and chorus frog eggs, larvae, juveniles, and adults which were observed. Additionally, this portion of the river is of sufficiently low gradient and support patches of sandy and fine gravel substrates. The primary source of flows in this portion of the river is from upstream water reclamation plants and temporary water releases from Castaic dam. Overall, the stream bottom throughout the reach is characterized as sandy to gravelly with little accumulated silt. Braided, open low-flow channels, sandbars, and sparsely vegetated terraces are present in this zone. This zone supports areas characteristic of a sufficiently low gradient to support potential breeding pools. The reach is also subject to a natural flooding regime that will periodically scour riparian vegetation, rework stream channels and terraces, and redistribute sands and sediments, such that adequate numbers and sizes of breeding pools and sufficient terrace habitats with appropriate vegetation are maintained.

There are upland terraces within the river channel that could support over-wintering adult arroyo toad in this portion of the Newhall Ranch survey area. These terraces consist of sandy to gravelly soils with densities of vegetation varying from bare to dense, increasing with distance from the channel. Dominant vegetation includes willows, mule fat, cottonwood, and patches of non-native giant cane and tamarisk. Terraces within the river channel are subject to major storm events that have the potential to scour the entire area between the banks, which could ultimately result in the loss or displacement of any arroyo toad present in the reach at the time. However, the presence of some mature willows and cottonwoods suggest that the ground may be stable enough to withstand such storm events.

No non-native predators were observed within this reach, although non-native fish, African clawed frogs, and bullfrogs are known from nearby portions of the Santa Clara River and Castaic Creek.

Outside of the Riverbanks

There are no manmade barriers present in this reach that could completely or substantially impede upland movement of arroyo toads. However, it should be noted that considerable stretches of stream bank in this zone (along the southern channel bank) are near vertical and of a height that would significantly impede migration out of the stream channel.

Most of the upper terraces and foothill slopes (beyond the stream banks) are highly disturbed from long-standing agricultural uses. Both the north and south sides of the river support areas of active agriculture. In fact, nearly all of the upland habitat present along the northern channel bank is

currently under agricultural production. However, there are areas up upland habitat along the southern channel boundaries that have been designated as moderate quality due to the presence of sage scrub vegetation and absence of agriculture, although many upland areas present along the south bank are inaccessible due to the height and near vertical angle of the bank. Some of these areas support habitat features conducive to arroyo toad occupation, but there are only a few small areas where access would not be constrained by the presence of dense vegetation and/or height and steepness of adjacent banks.

Conclusion

Newhall Ranch Reach 2 supports a mosaic of habitat types and qualities. Though most of the high quality habitat occurs between the banks, there are some areas of moderate quality upland terrace habitat associated with this portion of the Santa Clara River, primarily located along the southern river bank where native sage scrub vegetation is present. However, most of the adjacent uplands consist primarily of agricultural fields, which are considered to be of low quality as most of these areas are difficult to access and they do not support habitat characteristics suitable for survival of over-wintering arroyo toads. As previously discussed, arroyo toads are periodically found in agricultural fields. However, due to the nature of land practices (i.e., tilling, disking, and pesticide use) it is expected that mortality rates in these areas exceed reproduction rates (FWS 2001a). No arroyo toads were found in agricultural fields during the subject survey. As such it is appropriate to consider these areas of low value as habitat for arroyo toads. The small areas that do support suitable upland habitat are characterized as moderate quality habitat, because overall, they would still be difficult for arroyo toads to access. As such, the best opportunities for over-wintering toad would be inside the stream banks where soil types are suitable and soil moisture is higher.

DISCUSSION/CONCLUSION

Based on the results of the studies conducted by Impact Sciences and from other surveys conducted in the vicinity over the past several years, it is appears that arroyo toads are absent in this portion of the Santa Clara River watershed. Though speculative, there are a number of possible explanations for their apparent absence. As most of the major arroyo toad studies have described in detail, there are a number of factors that contribute to the reduction of arroyo toad populations, and nearly all of these factors are present within the subject survey area.

Habitat destruction and alteration has been described by most experts as being the primary cause for the decline in arroyo toad numbers. Sweet (1992) identifies dams as being responsible for greatest

amount of suitable arroyo toad habitat and cites a number of examples. The Newhall Ranch area is affected both directly and indirectly by dams and other sources of flow regulation. Castaic Dam occurs between two contemporary documented populations of arroyo toad (FWS 2001a), which suggests it may have eliminated a considerable amount of suitable habitat for this species, in particular those areas located downstream of the dam.

Water flows along the Santa Clara River in the Newhall Ranch area during the survey period are largely attributable to the tertiary treated effluent releases from the WRP No. 32 and further upstream (adjacent to Bouquet Canyon Road Bridge) from WRP No. 26. Fluctuating flow rates and water levels from WRP releases may also be a factor in affecting suitable breeding habitat in the river.

Non-native predators can also be a contributing factor to the reduction of arroyo toad in the region. Though it was noted that bullfrogs and African clawed frogs were not recorded within the Newhall Ranch survey area. Ongoing eradication efforts may have temporarily reduced numbers of predatory amphibian species within the area. However, these predatory species are currently known from the immediate vicinity, and sometimes they can occur in great numbers, which results in adverse impacts to the arroyo toad (if historically present in the area). These frogs have been observed preying on various life stages of arroyo toad including eggs, larvae, and adults (Ramirez 2000). Non-native fishes feeding on larval and juvenile arroyo toad have also been recorded (Sweet 1992). Several predatory species of non-native fish are known from the Santa Clara River system. Though none was directly observed during the survey effort, it is likely they still occur and pose a threat to breeding toads.

Native predators also contribute to reduce numbers of arroyo toad in a given area. Two-striped garter snake and southwestern pond turtle were observed in both of the Newhall Ranch survey zones. Though declining in numbers themselves, when either of these two species encounters a breeding pool of arroyo toad tadpoles, they can significantly impact that population. Wading birds such as herons and egrets also have a potential to significantly impact tadpole populations.

Other land uses such as urbanization, agriculture, and mining can also contribute to the reduction of suitable habitat. Development reduces the amount of area available to locally occurring arroyo toads and factors such as increased human presence and non-native plants and animals, and alteration of water quality inevitably follow. Agriculture commonly includes regular tilling of soil and introduction of pesticides and herbicides, all contributing to the reduction of the amount of suitable habitat available to this species. Sand and gravel mining operations also directly impact river and streambeds and result in increased silt loads that can smother egg masses downstream.

The habitat evaluation portion of this study revealed that the majority of suitable arroyo toad habitat present within the Newhall Ranch area occurs between the banks of the Santa Clara River. Beyond the outer banks, both natural topography and human activities provide an inaccessible and/or inhospitable environment for any dispersing toads. However, it would appear that much of the upland habitat beyond the banks of the stream may not have historically provided suitable over-wintering habitat for adult arroyo toad due to the arid conditions and lack of constituent elements that characterize high quality arroyo toad habitat. As such, it is possible that arroyo toad numbers were never high (if historically present) in this portion of the Santa Clara River.

In summary, no arroyo toads were recorded within the portion of the Santa Clara River watershed included in the Newhall Ranch area, however this taxon does occur in very low numbers upstream. Whether one surmises that the upstream population(s) are a remnant of a once much larger population, or individuals from surviving upstream populations that may have been displaced during storm events from previous years, it is apparent that they are not breeding in the subject area and currently do not utilize habitats present within the Newhall Ranch survey areas.

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ENTRIX, Focused Special-Status Aquatic Species Assessment

FOCUSED SPECIAL-STATUS AQUATIC SPECIES ASSESSMENT - SANTA CLARA RIVER

LANDMARK VILLAGE PROJECT
NEWHALL RANCH, CALIFORNIA

Prepared for:
Newhall Land
Valencia, CA

Prepared by:
ENTRIX, Inc.
Ventura, CA

Project No. 3109002

June 30, 2005

Focused Special Status Aquatic Species Assessment
Santa Clara River

Landmark Village Project
Newhall Ranch, California

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1. INTRODUCTION

This report summarizes the focused assessment of potential effects of the Landmark Village (Project) on threatened or endangered aquatic species inhabiting the Newhall Ranch reach of the Santa Clara River, from the Castaic Creek confluence through the boundary of the proposed Landmark Project. Specifically, this report focused on potential impacts to unarmored threespine stickleback, arroyo toad, and California red-legged frog as these species are listed as threatened or endangered by the State and Federal Endangered Species Act. In addition, this assessment includes discussion of potential impacts to southwestern pond turtle and two-stripe garter snake designated by the State as "Species of Concern." The primary focus of this assessment is to examine potential impacts to the habitat of the above species resulting from alterations to local hydrology and corresponding habitat areas through implementation of the Project.

1.1 LANDMARK VILLAGE PROJECT (LANDMARK)

Newhall Land (Newhall) plans to develop approximately 291 acres of property west of Castaic Creek adjacent to the north bank of the Santa Clara River. The Project site is currently used for agricultural production, and is within the approved Newhall Ranch Specific Plan boundaries. Newhall retained ENTRIX to assess the potential effects of the Project on selected special-status aquatic species, including unarmored threespine stickleback, arroyo toad, California red-legged frog, southwestern pond turtle, and two-stripe garter snake. The primary features related to the Project examined in this assessment focus on buried soil cement bank stabilization along both the north and south banks of the Santa Clara River, construction of Long Canyon Road bridge over the river, which would include bridge abutments and piers, and exposed rock rip rap flanking the SR-126 bridge at Castaic Creek. The footprint of the buried bank stabilization is set back from the Santa Clara and the existing riparian corridor, and the exposed protection along Castaic Creek is along the margin of the active channel. This assessment addresses both the construction footprint of the bank protection as well as the anticipated hydrologic and water quality influences of the Project on in-stream habitat utilization.

1.2 BACKGROUND

Unarmored Threespine Stickleback

The unarmored threespine stickleback, *Gasterosteus aculeatus williamsoni*, was designated a federally endangered species in 1970 (U. S. Fish and Wildlife Service 1985) and a state endangered species in 1971. Populations are restricted to three sections of the upper Santa Clara River including the Newhall Ranch reach, which represents the downstream demarcation of the unarmored subspecies. Currently, Critical Habitat for unarmored threespine stickleback

has not been designated under the Endangered Species Act. The fish is a small, largely annual fish that requires shallow, slow, marginal stream flows with abundant aquatic vegetation for cover. The male guards territories and builds a small nest of decaying vegetation where he guards the eggs until they hatch. Large numbers of stickleback can exist in the summer and fall with the long breeding season in southern California, and breeding can be almost all year in dry years when a stream is minimally disrupted by storm flows. Up to a few hundred stickleback per 10 meters of stream can exist under optimum conditions. Strong storm flows usually severely decimate the population until the streams stabilize in spring and the numbers can build up again.

Other populations within the Santa Clara River watershed occur upstream of the Project site both in Soledad Canyon above Lang Station (about 12 miles upstream) and in San Francisquito Canyon from just below Drinkwater Reservoir upstream to the vicinity of the old St. Francis Dam location (about 11..5 miles upstream of the river). San Francisquito Creek actually enters the Santa Clara River about three miles upstream of the Project site near the upper end of the downstream unarmored population. Recently, a population was discovered in upper Bouquet Canyon (Jonathan Baskin, pers. comm.) about 11 miles above its mouth at the Santa Clara River. Perennial flows occur in the Santa Clara River downstream of the Saugus Water Reclamation Plant, which discharges tertiary treated effluent immediately downstream of the Bouquet Canyon Road bridge over the Santa Clara River. These populations are located upstream of the Project site and the hydrology and habitat where these populations are situated are clearly not affected by the Project.

Arroyo Toad

Arroyo toads (*Bufo californicus*) occupy the margins of permanent and seasonal streams in coastal foothill canyons and valleys and to a limited extent in the desert, but they require extremely specialized and limited microhabitat within that general habitat type. Most spawning occurs in shallow overflow pools adjacent to inflow channels of third and higher-order streams. During the remainder of the year, adults occupy adjacent sand bars and sandy terraces, nearly always within 100 meters of suitable spawning pools. Suitable spawning pools lack suspended silt, aquatic predators, and dense woody bordering vegetation (Sweet 1993). Suitable bordering sandbars are usually dampened by capillarity and often include sparse emergent vegetation. The moist substratum keeps metamorphosing juveniles from desiccating during warm summer weather (Sweet 1993; Jennings and Hayes 1994). Suitable terrace habitat includes at least some dense overgrowth, such as California sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii*), and willows (*Salix* sp.), but the understory is usually barren except for layers of dead leaves (Sweet 1993). Adult and metamorphosed juvenile arroyo toads are known to forage for various invertebrates around the drip line of large oaks (*Quercus*). They also forage extensively on ants (Sweet 1992, 1993). Little is known of arroyo toad winter

hibernaculum requirements, but these toads are believed to hibernate exclusively in the riverine terrace, above the level of frequent winter floods (USFWS 1999).

On April 13, 2005, the U.S. Fish and Wildlife Service issued its Final Designation of Critical Habitat for the Arroyo Toad. Unit 6, covering a portion of the Newhall Ranch reach of the Santa Clara River and once considered for inclusion in the Critical Habitat Area, has been removed from the Final Designation of Critical Habitat.

California Red-legged Frog

California red-legged frog (*Rana aurora draytonii*) habitat components include spawning pools and their terrestrial borders, spring/summer refuges, and subterranean hibernation sites. These may be combined at single sites or they may be separated by aquatic or terrestrial "dispersal corridors" (Hayes & Jennings 1989; Jennings & Hayes 1994). Spawning pools are the ecologically central components of California red-legged frog habitat, because they support all elements of the species' reproductive biology and also provide forage for all red-legged frog life stages. Spawning pools are typically permanent or extended seasonal ponds (through August), or stream/spring pools of 0.7-1.2 meters in depth, with dense bordering, emergent, and surface vegetation. Such pools may be as small as $1m^2$ in surface area, with no known upper area limit. Always present at spawning habitat is a large complex invertebrate fauna for juvenile forage, extensive submerged herbaceous and algal vegetation for tadpole forage, and small terrestrial mammals such as voles (*Microtus*) that are an important component of adult frog forage (Jennings & Hayes 1994). Most suitable ponds are also partially to fully sunlit with mud or silt substrata, environmental factors essential to promote dense floating and emergent vegetation. Large populations of exotic predators such as bullfrogs and exotic centrarchid fish are usually absent from California red-legged frog spawning pools.

Newly constructed or impounded ponds rarely support California red-legged frog populations—most spawning sites have existed in stable, relatively undisturbed form for decades (Barry unpbl; Hayes & Jennings 1989). Likewise, red-legged frog spawning habitat is usually absent from river bottomland, presumably because high springtime flows would disrupt spawning success by scouring spawning pools and discouraging long-term aquatic vegetative growth. California red-legged frogs are vulnerable to early season floods because they spawn in early to mid-winter.

Adult California red-legged frogs may move in late spring and summer to shaded pools along streams where undercut banks and exposed root masses offer secure refuges. However, an isolated summer refuge component appears not to be critical to population survival because many adult frogs may be found throughout the summer at spawning pools. Hibernaculum preferences probably include lentic substrata (pond bottoms) or any secure subterranean site

near spawning or summer refuge habitat, such as rodent burrows, vegetation mats, and root channels.

California red-legged frog "dispersal habitat" refers usually to stream courses that do not offer spawning or summer habitat but could be dispersal corridors between populations (USFWS 2002). Such corridors probably pertain more to populations in xeric localities; preliminary data from Marin County, California populations indicate that in mesic regions California red-legged frogs can disperse across any non-saline vegetated habitat (Gary Fellers, USGS, pers. comm.). "Dispersal habitat" as discussed in this report refers to any habitat that could be occupied temporarily by California red-legged frogs; it does not necessarily imply that California red-legged frogs might use such habitat to disperse or move among spawning pool habitats.

The 2001 Critical Habitat designation for the California red-legged frog was vacated by court order, but the U.S. Fish and Wildlife Service (2004a) reproposed Critical Habitat with substantially the same boundaries on 13 April 2004. A Final Rule is expected in spring 2005. Neither Critical Habitat designation included any part of the Santa Clara River or tributaries in the Landmark Project Area.

Southwestern Pond Turtle

Southwestern pond turtles (*Clemmys (Emys) marmorata pallida*), a California Species of Concern, require exposed permanent or extended seasonal (through August) slow or still water, bordered by or in the vicinity of suitable upland oviposition (egg deposition) habitat. Suitable oviposition areas are usually gently sloping treeless hillsides well above floodplains, with southern or southwestern exposure and clay or possibly sandy soil (Holland 1991). Eggs are deposited in flask-shaped vertical excavations from late spring through summer, and hatchlings apparently remain in the nest until the following spring (Holland 1991). All life history stages of post-emergent pond turtles are highly aquatic. Suitable aquatic habitat for adult pond turtles usually includes relatively deep water (at least 0.5 meter) with secure basking sites (logs, exposed banks, etc) within reach of secure subsurface concealment. The aquatic substratum may be silty, muddy, or rocky. Juveniles are generally more secretive than adults and may favor more secure basking habitat such as densely vegetated sections of ponds and stream pools (Barry unpbl. obs.). A complex invertebrate fauna and relatively high primary productivity typically also characterize southwestern pond turtle aquatic habitat (Jennings and Hayes 1994). The most important forage for hatchlings is nektonic plankton, but adults utilize a variety of plant and animal forage sources (Bury 1986).

Two-striped Garter Snake

The two-striped garter snake (*Thamnophis hammondii*) occurs from southern Baja California north to central Monterey and western Fresno Counties (Rossman and Stewart 1987). These snakes are found most frequently along the margins of rocky and sandy streams with fairly fast water, and they were formerly ubiquitous and abundant in association with such habitat throughout coastal southern California (Jennings and Hayes 1994). The two-striped garter snake is a California Species of Concern because most of its characteristic habitat in the lowlands of Southern California has been severely degraded and consequently this species has disappeared from substantial portions of its range (Stewart 1968; Jennings and Hayes 1994). Two striped garter snakes are believed to feed almost exclusively on fish and tadpoles, which they catch in shallow water by stalking, ambushing, or by cornering against submerged rocks or root masses (Jennings and Hayes 1994; Barry unpbl. obs). Thus, even though they are fundamentally terrestrial, they depend entirely on aquatic habitat for forage.

Although the preferred microhabitat for this species is poorly understood, the greatest numbers seemingly occur in areas along stream courses where the combination of in-stream rocky or other cover, terrestrial vegetative or other cover, and easy access to aquatic forage species of the appropriate size range exists (Barry unpbl obs.). For example, along relatively undisturbed reaches of the San Gabriel River in the San Gabriel Mountains these snakes are frequently found along relatively shallow rocky pools that laterally border somewhat deeper reaches, and they also frequent exposed root masses associated with pools created by the fallen trees. Smaller fish and tadpoles are typically abundant and easy for the snakes to capture in the shallow sections and the root mass pools, and larger fish occur in the adjacent deeper sections (Barry unpbl. obs.). Shoreline rocks, burrows, and dense vegetation (including root masses) offer excellent terrestrial cover, and submerged rocky aggregations offer aquatic refugia. Thus, although these wary snakes are often abundant and easily observed in such habitat, they are difficult to capture because they rarely stray far from secure cover and they flee rapidly into the water when approached (Barry unpbl. obs.).

Two-striped garter snakes are active nearly year-round in the Southern California lowlands, but in higher elevations they hibernate for a variable time span during the winter, and emerge as early as February. They usually mate soon after emergence, but females of this species can become gravid with sperm stored from matings that occurred as long as two years previously (Stewart 1972). Two-striped garter snakes bear live young in litters that average 8-10, usually in late July (Rossman and Stewart 1987). Mortality in newborns is probably fairly high, in particular because newborns may have difficulty securing small amphibian or fish prey in disturbed waterways (Jennings and Hayes 1994; Barry unpbl. obs.).

1.3 STUDY SCOPE

The scope of this assessment is on the potential effects of the Project on the target aquatic species described above. The assessment is based on a review of technical and regulatory documents provided by Newhall Land (Section 2.1) and a field reconnaissance survey of the Project site. Additionally, the preparers of this assessment have relied upon their extensive knowledge and experience on this subject. See Section 5, below, for a list of the preparers of this assessment. In addition, please refer to Appendix B for copies of the resumes of the preparers. No new quantitative surveys or analyses were conducted as part of this study.

1.4 ORGANIZATION OF DOCUMENT

The remainder of this report is organized as follows:

- **Section 2** describes the methods used in the development of the assessment.
- **Section 3** discusses the results of this assessment.
- **Section 4** cites literature and technical references used in the preparation of this assessment. These reference documents are incorporated herein by this reference.
- **Section 5** is the list of preparers of this assessment.

2. METHODS

The methods used to conduct this assessment are based on review of technical and regulatory documentation provided by Newhall, and field reconnaissance surveys of the Project area. The methods are described in greater detail below.

2.1 REVIEW OF EXISTING PROJECT REPORTS AND DOCUMENTATION

The following technical reports and supporting documentation were reviewed in assessing the potential effects of the Landmark Village Project on sensitive aquatic species inhabiting the Santa Clara River and their habitat:

- *Biological Resources Assessment of the Proposed Santa Clara River Significant Ecological Area. Los Angeles County Department of Regional Planning. PCR Services Corporation, Frank Hovore and Associates, FORMA Systems, November 2000.*

- *Final EIS/EIR: 404 Permit and 1603 Streambed Alteration Agreement for Portions of the Santa Clara River and its Tributaries, Los Angeles County*. Valencia Company, August 1998.

- *Results of Focused Surveys for Arroyo Toad and Special-Status Aquatic Reptiles and Amphibians, River Village Project; Newhall Ranch, Valencia, California. Newhall Ranch Company, Compliance Biology, Inc, Camarillo, CA, October, 2004.*

- *Biological Resources of the Upland Areas of the West Ranch. Newhall Land and Farming Company, Valencia, California, Dames and Moore, Santa Barbara, California, July 1993.*

- *Natural River Management Plan: Permitted Projects and Activities*. Santa Clara River and tributaries. Valencia Company, November 1998.

- *Results of Focused Surveys for Arroyo Toad and Special-Status Aquatic Reptiles and Amphibians within the Natural River Management Plan Area, Valencia, California.* Impact Sciences, September 2001.

- *Aquatic Surveys Along the Santa Clara River Part I: Castaic Junction Project Area, Los Angeles County, California.* Aquatic Consulting Services, Inc., April 2002.

- *Aquatic Surveys Along the Santa Clara River Part III: West of Commerce Center Bridge to the Ventura County Line, California.* Aquatic Consulting Services, Inc., June 2002.

- *Biological Opinion for the Natural River Management Plan, Santa Clarita, Los Angeles County, California (1-8-02-F-4R) (File No. 940050400-BAH)*. U.S. Fish and Wildlife Service, November 2002.

- *Results of Focused Surveys for Unarmored Threespine Stickleback and Other Special-Status Fish Species, Newhall Ranch, Valencia California.* Impact Sciences, Inc., January 2003.

- *Results of Focused Surveys for Arroyo Toad and Special-Status Aquatic Reptiles and Amphibians within the Newhall Ranch Area, Los Angeles County, California. Newhall Land and Farming,* Impact Sciences, Inc., *September 19, 2001.*

- *Letter from Scott Cameron (Ecological Sciences, Oxnard, CA) to Rick Farris, U.S. Fish and Wildlife Service, Ventura, CA, Subject: Permit submittal requirements, TE 808242, arroyo toad surveys, Los Angeles County, California, August 2, 2001.*

- *Letter from Scott Cameron (Ecological Sciences, Oxnard, CA) to Mark Subbotin, Newhall Ranch Co, Valencia, CA, Subject: Results of focused arroyo toad surveys, Auto Center Expansion Project and Hart Baseball and Softball Complex (Hart Complex Area), Santa Clarita, California.*

- *Letter from David Crawford (Impact Science, Inc, Agoura Hills, CA) to Mark Subbotin, Newhall Land and Farming, Subject: Brief summary of arroyo toad survey results in NRMP area, June 18, 2001.*

- *Biota Report, Newhall Ranch Specific Plan, Los Angeles County Department of Regional Planning, Los Angeles, California, September 7, 1995, July 1996 revision.*

- *SEATAC Biota Report, Combined San Francisquito Canyon Projects (West Creek (VTTM 52455) and East Creek (VTTM 44831, 52667), Newhall Land and Farming Company, Significant Ecological Area 19, San Francisquito Canyon, Los Angeles County, California, Los Angeles County Department of Regional Planning, Frank Hovore & Associates, San Marino Environmental Associates, Planning Consultants Research, August 19, 1998.*

- *Amended 404 Permit (No. 940050400-BAH) for Natural River Management Plan.* U.S. Army Corps of Engineers, June 2003.

- *Proposed Designation of Critical Habitat for the California red-legged frog (Rana aurora draytonii), U.S. Fish and Wildlife Service, April 13, 2004, 69 FR 19620-19642.*

- *Proposed Designation of Critical Habitat for the Arroyo Toad, U.S. Fish and Wildlife Service, April 28, 2004, 69 FR 23254-23328.*

- *Final Designation of Critical Habitat for the Arroyo Toad, Final Rule. U.S. Fish and Wildlife Service, April 13, 2005, 50CFR Part 17 (RIN 1018-AT42).*

- *Revised Additional Analysis to the Newhall Ranch Specific Plan and Water Reclamation Plant Final Program EIR, Volume VIII (May 2003), Section 2.3, Floodplain Modifications.*

- *Flood Technical Report for the Landmark Village Project (2005). Pacific Advanced Civil Engineering, Inc. (PACE)*

- *Landmark Village Water Quality Technical Report. (GeoSyntec Consultants 2005).*

2.2 REVIEW OF RECORDS AND LITERATURE

Information on the special-status wildlife of the proposed Landmark Project Area was obtained through a search of the *California Natural Diversity Database* (CNDDB; CDFG, 2004); from searches of the specimen catalogues of the major California vertebrate museum collections (detailed below); from the U.S. Fish and Wildlife Service (USFWS), Ventura Office, Endangered Species Division's species list (USFWS 2003); and from reports on biological studies completed in the Project vicinity. Preliminary identification of potential habitat for sensitive aquatic species within the Project site was determined by reviewing aerial photography provided by Newhall Land. Site visits on 31 March and 10 November 2004 identified other potential habitat.

The first step to evaluate Project effects on potential populations of the target special-status aquatic species is to determine the historical presence of these species within the Project area. ENTRIX biologists queried the California Natural Diversity Database (CDFG 2004), the collection catalogue of the Los Angeles County Museum of Natural History (LACM), and the online collection databases of the Museum of Vertebrate Zoology, University of California, Berkeley (UC Berkeley 2004); and the California Academy of Sciences (CAS 2004), to obtain this information. Various literature sources were also used. (Disclaimer: CNDDB and museum records always carry some degree of uncertainty because of potential misidentifications or incorrect locality data. Further, the absence of species records from any given site does not imply that the species is absent from the site).

The ENTRIX biologists then examined maps and aerial photographs to locate aquatic habitat within and near the banks of the Santa Clara River within the Project site. Aquatic habitat suitability for any of the reptile and amphibian species was determined by comparison with

previously published assessments (e.g., Holland 1991; Jennings and Hayes 1994; Sweet 1992, 1993; USFWS 1999, 2002), as well as by the ENTRIX biologists' extensive experience with the species in various parts of California. To assess the potential effects of the proposed Project on unarmored threespine stickleback, arroyo toad, California red-legged frogs, southwestern pond turtles, and two-striped garter snakes, ENTRIX biologists consulted the USFWS Biological Opinion for the Natural River Management Plan (NRMP), Santa Clarita, Los Angeles County, California (1-8-02-F-4R), dated 15 November 2002; various natural history accounts for these species (e.g., Jennings and Hayes 1994; Holland 1991; Sweet 1992; Swift et al. 1993; Stebbins 1951); Newhall Ranch Specific Plan Final Program EIR (March 1999); Revised Additional Analysis to the Newhall Ranch Specific Plan and Water Reclamation Plant Final Program EIR, Volume VIII (May 2003), Section 2.3, Floodplain Modifications; *Landmark Village Water Quality Technical Report. (GeoSyntec Consultants April 2005);* and the PACE Flood Technical Report for the Landmark Village Project (2005).

2.3 FIELD RECONNAISSANCE SURVEYS

Several herpetological and ichthyological reconnaissance surveys were conducted in the spring and late fall of 2004 to document habitat conditions within the Project area (Figure 1). An additional reconnaissance was performed in February 2005 following a severe January flood event (Figure 2). The survey activities are more fully described in the following sections.

Herpetological Reconnaissance Surveys

ENTRIX biologists, Sean Barry and Matt Carpenter, conducted reconnaissance-level field surveys, focused on the following sensitive aquatic vertebrate species and their associated habitat within the Santa Clara River floodplain: 1) southwestern arroyo toad; 2) California red-legged frog; 3) southwestern pond turtle; and 4) two-striped garter snake. The purpose of field surveys was to analyze the potential effects of the Landmark Village Project on these species and their habitat.

The surveys were conducted on March 31 and November 10, 2004 in and along the Santa Clara River, within the boundaries of the Landmark Project site (Castaic Creek west to Chiquito Creek). The Project site was examined for aquatic habitat, such as flowing or standing water, emergent vegetation, and associated aquatic species. During the November survey, the ENTRIX biologist photographed the Santa Clara River channel within the Project area every 100-200 feet, and also photographed other areas of potential aquatic species habitat, to document the stream cross-sections and to document any potential bordering and other associated cover, pool, and channel habitat. See Appendix A for photographs.

Potential habitat for arroyo toads, California red-legged frogs, western pond turtles, and two-striped garter snakes was noted, along with other features relevant to life history, such as the presence of prey or predators. Habitat factors noted for arroyo toads included the presence of clear, standing water (required for egg deposition), sandy banks, and the presence of willows, cottonwood, and sycamore trees. Habitat factors noted for California red-legged frogs included relatively deep and vegetated sunlit pools. Habitat factors noted for southwestern pond turtles included permanent or nearly permanent water, depth of water, basking sites such as partially submerged logs, rocks, mats of floating vegetation or open mud banks, and suitable terrestrial sites for egg-laying. Habitat factors noted for two-striped garter snakes included isolated stream channels with adjacent shallow and deep moving water with bordering vegetative (including root masses) or rocky cover, in-stream cover, and evidence of fish.

Ichthyological Reconnaissance Surveys

ENTRIX biologists, Dr. Camm Swift and Steve Howard, conducted reconnaissance-level field surveys, focused on unarmored threespine stickleback. The purpose of these field surveys was to analyze the potential effects of the Landmark Project on this species and its associated habitat. The entire reach of the Santa Clara River from the mouth of Salt Creek to the Castaic Junction was surveyed on March 31 and April 1, 2004. An additional survey was conducted on November 8, 2004 in the Santa Clara River and Castaic Creek from the mouth to the State Route 126 (SR-126) Bridge within the Landmark Village Project area. The surveys focused mainly on evaluating habitat conditions within these reaches and in establishing the relative proximity from the stream side Project boundary to in-stream habitats. Most of these efforts were visual habitat assessments documented by field photographs with special reference to unarmored threespine stickleback and other fishes. Some collecting was conducted with a small seine (1.8 X 1.2 m, 3 mm mesh/6 X 3 feet, one eighth inch mesh) and aquarium dip nets in habitats that could potentially contain sticklebacks. Further upstream, the Santa Clara River at the Commerce Center Drive Bridge area and Castaic Creek near the Interstate 5 Bridge, was examined on December 16, 2004.

Winter 2005 Post-Flooding Reconnaissance Surveys

Camm Swift and Sean Barry conducted an additional survey within the Landmark Village Project reach of the Santa Clara River on February 1, 2005 to document and evaluate habitat changes due to the recent large storm flows that disturbed much of the habitat that was previously examined.

3. RESULTS

This section discusses the results of the assessment and addresses potential impacts of the Project on the target special-status aquatic species. Based on the review of hydraulic modeling documents provided, it appears that very little or no physical in-stream changes will result from the Project. This assessment focuses on the effect of bank stabilization on those species and does not address other terrestrial features of the Project. Much of the existing terrestrial habitat is currently in a disturbed (agricultural) state and is poorly suited for the target species. The hydraulic models reviewed suggest that the in-stream conditions will not be affected by the bank protection features except in extreme flood event years.

The results of the assessment for each species is described further below:

3.1 UNARMORED THREESPINE STICKLEBACK

Historical and Recent Vicinity Records

Unarmored threespine stickleback collections have been few and widely scattered in the Del Valle Zone of the Santa Clara River with a few notable exceptions. One exception is the refuge area identified during the surveys for the Mobil and Arco 1994 oil spill investigations. This is an area of marshy habitat just north northeast of Magic Mountain that apparently is always wetted and contains numerous stickleback. During the oil spill, this refuge area was apparently not affected since the main river flow directed the contamination away from this sensitive area.

Thus, it was also considered a site for relocating rescued stickleback that could not be returned to the main river immediately because of the oil contamination.

Results of ENTRIX Field Reconnaissance

The March 31 and April 1, 2004 surveys were during relatively high spring flows and the river had recently been scoured and fresh sediments were present. Also virtually all marginal herbaceous vegetation and other cover was washed out along much of the river. Due to an unusual set of strong October rain storms, the river was also scoured out during the visits in November and December 2004. Typically, the November and December collections would precede any high flows, marginal herbaceous vegetation would be well developed, and fishes would be abundant. Due to the early storms, the habitat conditions noted during our surveys were comparable to those normally associated with early spring conditions. In some drought years, the river goes without being substantially scoured out and fishes can remain abundant all year. For our spring 2004 surveys, the habitat was more or less in early spring scoured conditions.

During the spring 2004 survey, the river was running a visually estimated 30 to 40 cubic feet per second (cfs) and was turbid with visibility to about 50 cm. Some small spring tributaries and isolated pools were clear. The water temperature ranged from 22-26 degrees and at least four areas of upwelling with water at 18 to 20 degrees C. The substrate was variously sand, gravel, and cobble and 10-40% of the margins of the river had some vegetative cover such as herbaceous vegetation, debris, or overhanging trees or bushes. This marginal vegetation was just beginning to develop, as was green algae in the water. About 30-40% of the habitat was low to high gradient riffles with the remaining being runs. Eight to ten deeper, standing or backwater pools, more than 1 m deep, were seen near large obstructions. In the area of the mouth or delta of Castaic Creek in the Santa Clara River, a small flow entered the main river with a few associated pools and backwaters. However, it was emerging from the stream bed a few hundred meters upstream since the main Castaic Creek was dry farther upstream. In about 30 seine hauls and 140 dips with aquarium dip nets, throughout the stretch examined over the two days, no stickleback were taken or seen. Arroyo chubs were abundant, and one Santa Ana sucker was taken. Larval arroyo chubs were commonly seen and up to about 15 sucker larvae were observed. Some backwater areas had clawed frogs and about 25 were taken. In addition, several clawed frog larvae were seen in isolated floodplain pools.

The survey on November 8, 2004 was restricted specifically to the Landmark Village Project area and the well scoured channel with an estimated 25-30 cfs of flow and sand was about 75% of the substrate and gravel, cobble, and rock the other 25% in the main river. Visibility was about 50 cm in the main river and some isolated ponds were clearer. Several isolated or spring fed pools existed in the riparian areas on the north side of the floodplain and were choked with cattails, willows, and Arundo. The shores of the main river channel where almost entirely scoured off by the October storms. Ten seine hauls took six half grown to adult unarmored threespine stickleback in backwater areas of the main river that serve as small refuges during scouring flows. Arroyo chubs were common in the river with over 150 taken, and in the oxbow ponds crayfish (about 20 taken) were common. One large arroyo chub was taken in the oxbow ponds, along with one small clawed frog. A few mosquitofish were collected and other seen in the protected oxbows. Even though some fish were common or very locally abundant, these were in occasional oxbow and marginal areas with most areas of faster flow devoid of fishes.

On the December 16, 2004 visit, Castaic Creek was dry all the way to the SR-126 Bridge, and the only wetted areas were near storm drains that were surveyed earlier this year and found to be fishless. The Commerce Center Drive Bridge area was similar to the river downstream examined by Swift and Howard, but no fish collections were made and no fish were seen. The Commerce Center Drive Bridge is upstream of the Landmark Village Project.

Following a severe flood event in January 2005, ENTRIX biologists conducted a one-day reconnaissance survey of the Project reach to evaluate the response of habitat conditions.

Generally, plant and animal life had been flushed from the active stream channel. Riparian and aquatic vegetation along the stream margins had been scoured. Few or no aquatic insects were observed during numerous spot inspections. The streambed also aggraded in many areas, particularly in backwater pools where significant shallowing or complete filling had occurred. Significant deposition of sand and gravel was also observed in the forms of lateral and mid-channel bars. Most exotic aquatic species appeared to have been flushed out by the flooding events. Based on this survey, the observed flood event would have flushed out most aquatic species due to its size and severity, with or without the proposed Project improvements. Figure 2 illustrates the state of channel conditions in the Santa Clara River along the Project area following the January 2005 flood.

Project Impacts

The potential impacts to unarmored threespine stickleback due to the construction and persistence of the Project's bank stabilization features and the bridge construction are expected to be less than significant. Stickleback are known to inhabit the Newhall Ranch reach of the Santa Clara River adjacent to the Landmark Village Project area. The location of the proposed stabilization features is set back beyond the existing riparian corridor in a majority of the Project and construction would not interface with the active stream channel. The hydrologic influence of the bank stabilization on fish is likely to be essentially transparent when viewed in conjunction with flood flow conditions. Based on reconnaissance surveys conducted following recent flood events (January and February 2005), high flow conditions appear to have dislocated and dispersed aquatic organisms downstream.

The Flood Technical Report for the River Village Project (PACE 2005) found that there would be no significant impacts in water flows, velocities, depth, sedimentation, or floodplain and channel conditions adjacent to and downstream of the Project site as a result of the proposed Project improvements. These hydraulic effects were also found to be insufficient to alter the amount, location and nature of aquatic and riparian habitats in the Project area and downstream into Ventura County. The technical analysis further determined that the river would still retain sufficient width to allow natural fluvial processes to continue; and, as a result, the mosaic of habitats in the river that support various sensitive species would be maintained, and the population of the species within and immediately adjacent to the river corridor would not be significantly affected. Based on that technical assessment, no impacts to adjacent or downstream populations of the unarmored threespine stickleback are expected.

The Landmark Village Water Quality Technical Report (GeoSyntec 2005) indicates that the modeled concentrations in runoff from developed areas with Project Design Features (PDFs) are below all benchmark water quality objectives and criteria and TMDL waste load allocations for the Santa Clara River and are addressed by a comprehensive site design, source control,

and treatment control strategy. These water quality objectives are established to protect various beneficial uses including general wildlife, sensitive, rare and endangered species. Therefore, potential impacts from the Project on receiving water quality and beneficial uses in the Santa Clara River are not significant. Based upon that Report, no impacts to adjacent or downstream populations of unarmored threespine stickleback are expected.

3.2 ARROYO TOAD

Historical and Recent Vicinity Records

Neither of the museum database queries (CAS 2004; UC Berkeley 2004) yielded records of the arroyo toad from the main channel of the Santa Clara River. However, mainstem Santa Clara River CNDDB records for the arroyo toad exist from the "Santa Clara River, just east of Interstate 5" (1994), which is about two miles east of the River Village Project site, and from "Bear Canyon at the Santa Clara River, six miles upstream of Solemint" (2001), which is about eleven miles east of the Project site. Arroyo toads were also found recently at the confluence of San Francisquito Creek and the Santa Clara River, about 2.3 miles east of the River Village Project (Impact Sciences 2001). Further, the Aquatic Consulting surveys (2002a) reported arroyo toad tadpoles from pools adjacent to the Valencia Water Treatment Plant and from a pool just upstream of the River Village Project area (site 26). Among north tributaries to the Santa Clara River, arroyo toads are well-known from the Blue Point area along Piru Creek (CNDDB, LACM, and CAS records); from several sites along Sespe Creek (Ventura County) (CNDDB and LACM records and Sweet (1992)); and from at least one location along Castaic Creek north of Castaic Lake (CNDDB 2004; Compliance Biology 2004; U.S. Fish and Wildlife Service 2004). The existence of tributary records upstream and downstream of the Project area, as well as the in-channel Santa Clara River records west of Interstate 5 place the Project site within the probable distribution of the arroyo toad in the Santa Clara River channel. The recent origin of many of the records indicates that the arroyo toad still inhabits suitable habitat within the Santa Clara River basin, including the main channel. However, although standardized USFWS "protocol" surveys conducted recently within the Landmark Village Project site (Impact Sciences 2001; Compliance Biology 2004) showed that all of the components of arroyo toad habitat exist within the Landmark Village Project boundaries, these studies failed to document the occurrence of arroyo toads within such boundaries. Non-protocol surveys by Aquatic Consulting Services (2002b) also identified arroyo toad habitat in the Santa Clara River from the Landmark Village Project downstream to the Ventura County line.

Results of ENTRIX Field Reconnaissance

The March 31, 2004 survey was conducted during daylight hours from just northwest of the Travel Village trailer park along Castaic Creek downstream to the Wolcott Road crossing, with particular attention to the braided Castaic Creek channel complex just upstream of the confluence with the Santa Clara River. A spot survey was also conducted at the Long Canyon crossing downstream of Wolcott Road. Potential arroyo toad spawning habitat in the form of overflow pools with stable gravel or sandbars and nearby terrace vegetation was noted throughout the braided channel, and in the main stem of the Santa Clara River just downstream of the Wolcott Road crossing on the north and in places on the south sides of the river. Although the water level was fairly high because of winter storm runoff, overflow pools were visible but submerged upstream of the Long Canyon crossing, on the north bank of the river mainstem. No arroyo toads were observed during this reconnaissance surveys, but none would be expected because of the early season and the time of day of the survey.

The November 10, 2004 survey was conducted during daylight hours from the junction of Chiquito Creek and SR-126 downstream to the Santa Clara River, then upstream along the mainstem Santa Clara River to the confluence with Castaic Creek, then upstream along Castaic Creek nearly to SR-126. Flows in the mainstem river were lower than they had been the previous March, although they were undoubtedly recently augmented by heavy autumn rains. However, Chiquito Creek was dry between SR-126 and the Santa Clara River, and the Chiquito Creek channel was not incised or otherwise well defined close to the confluence. This suggests that Chiquito Creek flows downstream of SR-126 tend to be very episodic, short term, and sediment-loaded. A long overflow channel was visible along the north side of the Santa Clara River between the Long Canyon crossing and Wolcott Road, but this channel was choked with several generations of emergent vegetation (especially cattails (*Typha*)) and may not be suited to arroyo toad spawning. This is probably the same channel that was submerged but visible during the March 31, 2004 survey. The braided complex at the Castaic Creek confluence was mostly dry, but the main channel of Castaic Creek where it parallels and eventually flows into the Santa Clara River just upstream of the Wolcott Road crossing still held substantial water (to about 18 inches depth). How much of this had resulted from the recent rains was not clear. Castaic Creek itself from the braided complex upstream to SR-126 was essentially dry, and overflow channels of the type preferred by arroyo toads as spawning habitat were not evident upstream of the braided complex. However, bordering terrace habitat on the south side of the Santa Clara River and along much of Castaic Creek was clearly well suited to arroyo toads. No arroyo toads were observed during this survey, but none would be expected because of the lateness of the season, the time of day of the survey, and the prevailing cool weather.

Following a severe flood event in January 2005, ENTRIX biologists conducted a brief one-day reconnaissance survey of the Project reach to evaluate the response of habitat conditions. Generally, plant and animal life had been flushed from the active stream channel. Riparian and aquatic vegetation along the stream margins had been scoured. Few or no aquatic insects were

observed during numerous spot inspections. The streambed also aggraded in many areas, particularly in backwater pools where significant shallowing or complete filling had occurred. Significant deposition of sand and gravel was also observed in the forms of lateral and mid-channel bars. Most exotic aquatic species appeared to have been flushed out by the flooding events. Based on this survey, the observed flood event would have flushed out most aquatic species due to its size and severity, with or without the proposed Project improvements. Figure 2 illustrates the state of channel conditions in the Santa Clara River along the Project area following the January 2005 flood.

The early 2005 flood events severely altered riparian habitat conditions which may take up to several years to finally reach pre-flood condition equilibrium. Overall, the surveys confirmed that limited potential arroyo toad spawning and foraging habitat typically exists along the Santa Clara River and possibly Castaic Creek within the Landmark Village Project Area boundaries. However, the results of the focused USFWS protocol surveys cited above indicate that arroyo toads are very scarce or absent along these reaches, and along the Santa Clara River downstream to the Los Angeles-Ventura County line (Aquatic Consulting Services 2002). The following discussion of Project impacts pertains only to available arroyo toad foraging and spawning habitat within the Landmark Village Project Area.

Project Impacts

Although the arroyo toad has not been recorded from within the Project area, seemingly suitable, but limited, habitat exists within the Project boundaries in the reach from Castaic Creek downstream at least to Wolcott Road and possibly to the Long Canyon crossing. It is not anticipated that the proposed Project's bank stabilization features will substantially alter the local sediment transport regime or otherwise affect in-stream habitat (spawning, foraging) for arroyo toad. The Project area falls within an extremely dynamic reach of the Santa Clara River where high disturbance flood events occur every 5 to 10 years and change the existing stream structure. The EIR/EIS for the NRMP area, located directly east of the Landmark site, stated that the widening of the river channels within the areas of bank protection (i.e., stabilization) would not cause system-wide channel or bed erosion, or aggradation. In its 1998 and 2002 Biological Opinions on the NRMP (p. 30), the U.S. Fish and Wildlife Service accepted the NRMP's findings, and stated further that the NRMP would not affect arroyo toad habitat negatively within the Santa Clara River mainstem. Utilization of these same methods of bank protection in Landmark are anticipated to lead to the same result – no affect of arroyo toad habitat.

The Flood Technical Report for the Landmark Village Project (PACE 2005) found that there would be no significant impacts in water flows, velocities, depth, sedimentation, or floodplain and channel conditions downstream of the Project site as a result of the proposed Project

improvements. These hydraulic effects were also found to be insufficient to alter the amount, location and nature of aquatic and riparian habitats in the Project area and downstream into Ventura County. The technical analysis further determined that the river would still retain sufficient width to allow natural fluvial processes to continue; and, as a result, the mosaic of habitats in the river that support various sensitive species would be maintained, and the population of the species within and immediately adjacent to the river corridor would not be significantly affected. Based on that technical assessment, no impacts to downstream populations of the arroyo toad are expected.

The Landmark Village Water Quality Technical Report (GeoSyntec 2005) indicates that the modeled concentrations in runoff from developed areas with Project Design Features (PDFs) are below all benchmark water quality objectives and criteria and TMDL waste load allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy. These water quality objectives are established to protect various beneficial uses including general wildlife, sensitive, rare and endangered species.

Therefore, potential impacts from the Project on receiving water quality and beneficial uses in the Santa Clara River are not significant. Based upon that Report, no impacts to downstream populations of arroyo toad are expected.

3.3 CALIFORNIA RED-LEGGED FROG

Historical and Recent Vicinity Records

There are no California Natural Diversity Database records for the California red-legged frog from the Santa Clara River watershed, Los Angeles and Ventura Counties. However, the Museum of Vertebrate Zoology (UC Berkeley 2003) lists 17 specimens from Soledad Canyon (Santa Clara River channel) in its collection, from as recently as 1953. More precise locality data are unavailable. The California Academy of Sciences (CAS 2003) also lists a Soledad Canyon specimen, from 1950. The nearest specific locality to the Project site is some 15 miles upstream near the confluence with Agua Dulce Creek. Jennings and Hayes (1994) and the CNDDB indicate that this species still occurs in the Santa Clara River watershed, in sites along San Francisquito Creek 5-10 miles northeast of the Project site, and in tributaries to the Santa Clara River in Ventura County. The closest documented Ventura County occurrence is in Piru Creek 4.5 miles north of Piru, about 10 airline miles west to north-west of the Project site (USFWS 2002). Potential spawning habitat for California red-legged frogs also exists in some

of the small tributaries that flow north into the Santa Clara River, within and near the Project boundaries. Further, the verified records upstream and downstream of the Project site place the Project site within the distribution of the California red-legged frog along the Santa Clara River.

Results of ENTRIX Field Reconnaissance

The field evaluations indicate that potential spawning or summer habitat for the California red-legged frog is absent from the main channel of the Santa Clara River within the Project site. Further, the various USFWS protocol surveys for arroyo toads conducted along the Santa Clara River from Santa Clarita to the Ventura County line during the past few years would probably have found California red-legged frogs if they occurred in the mainstem of the Santa Clara River, but none were reported during these surveys. California red-legged frogs generally avoid large river channels with widely fluctuating flows, because such habitat usually does not permit reproductive activity (Hayes and Jennings 1989). For example, episodic winter flooding (typical of the Santa Clara River stream channel) may dislodge egg masses, and subsequent desiccation before the summer (also typical of the Santa Clara River) would kill tadpoles before they could metamorphose. Conversely, during the late winter and autumn, when California red-legged frogs may be most likely to move randomly (USFWS 2002), the mainstem Santa Clara River channel can be considered potential “dispersal habitat,” primarily because adult frogs can survive in the main channel during that season.

Following a severe flood event in January 2005, ENTRIX biologists conducted a one-day reconnaissance survey of the Project reach to evaluate the response of habitat conditions. Generally, plant and animal life had been flushed from the active stream channel. Riparian and aquatic vegetation along the stream margins had been scoured. Few or no aquatic insects were observed during numerous spot inspections. The streambed also aggraded in many areas, particularly in backwater pools where significant shallowing or complete filling had occurred. Significant deposition of sand and gravel was also observed in the forms of lateral and mid-channel bars. Most exotic aquatic species appeared to have been flushed out by the flooding events. Based on this survey, the observed flood event would have flushed out most aquatic species due to its size and severity, with or without the proposed Project improvements. Figure 2 illustrates the state of channel conditions in the Santa Clara River along the Project area following the January 2005 flood.

Project Impacts

As indicated above, field evaluations indicate that potential spawning or summer habitat for the California red-legged frog is absent from the main channel of the Santa Clara River within the Project site. Within the Project site boundaries, impacts to California red-legged frogs would probably result only from construction activity effects on the unlikely presence of dispersing red-

legged frogs during the construction process. On that basis, implementation of Project improvements would not significantly affect California red-legged frog populations.

The Flood Technical Report for the Landmark Village Project (PACE 2005) found that there would be no significant impacts in water flows, velocities, depth, sedimentation, or floodplain and channel conditions downstream of the Project site as a result of the proposed Project improvements. These hydraulic effects were also found to be insufficient to alter the amount, location and nature of aquatic and riparian habitats in the Project area and downstream into Ventura County. The technical analysis further determined that the river would still retain sufficient width to allow natural fluvial processes to continue; and, as a result, the mosaic of habitats in the river that support various sensitive species would be maintained, and the population of the species within and immediately adjacent to the river corridor would not be significantly affected. Based on that technical assessment, no impacts to downstream populations of the California red-legged frog are expected.

The Landmark Village Water Quality Technical Report (GeoSyntec 2005) indicates that the modeled concentrations in runoff from developed areas with Project Design Features (PDFs) are below all benchmark water quality objectives and criteria and TMDL waste load allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy. These water quality objectives are established to protect various beneficial uses including general wildlife, sensitive, rare and endangered species.

Therefore, potential impacts from the Project on receiving water quality and beneficial uses in the Santa Clara River are not significant. Based upon that Report, no impacts to existing populations of Red-legged Frog are expected.

3.4 SOUTHWESTERN POND TURTLE

Historical and Recent Vicinity Records

Southwestern pond turtles are probably distributed throughout the Santa Clara River watershed, wherever there is sufficient permanent or near-permanent water and oviposition sites to support populations. However, the CNDDB includes only two Santa Clara River records of southwestern pond turtles, from near Castaic Junction (2000) and from downstream near the Ventura County line (1998). Neither of the museum databases includes any Santa Clara River watershed southwestern pond turtle records. Conversely, the Impact Sciences (2001) report states that during those surveys pond turtles were observed numerous times at unspecified sites within the NRMP reaches, presumably where sufficient water existed to satisfy the aquatic habitat requirements discussed previously.

Results of ENTRIX Field Reconnaissance

During the March 31, 2004 field reconnaissance survey, ENTRIX biologists observed pond turtles at the confluence of Castaic Creek and the Santa Clara River and at the Long Canyon crossing. The November survey revealed that suitable aquatic habitat remains in the mainstem late in the year (presumably augmented by autumn rains). Neither survey identified specific terrestrial oviposition habitat, but moderate west- and south-facing meadowland slopes in the canyon openings appear to supply oviposition habitat requirements. Some potentially suitable oviposition habitat may also occur along the Castaic Creek embankment between the confluence with the Santa Clara River and Interstate 5. However, firm claylike soils, a possible oviposition site requirement (Holland 1991), seem to be absent from the mainstem channel, including the terrace on the north river bank.

Following a severe flood event in January 2005, ENTRIX biologists conducted a one-day reconnaissance survey of the Project reach to evaluate the response of habitat conditions. Generally, plant and animal life had been flushed from the active stream channel. Riparian and aquatic vegetation along the stream margins had been scoured. Few or no aquatic insects were observed during numerous spot inspections. The streambed also aggraded in many areas, particularly in backwater pools where significant shallowing or complete filling had occurred. Significant deposition of sand and gravel was also observed in the forms of lateral and mid-channel bars. Most exotic aquatic species appeared to have been flushed out by the flooding events. Based on this survey, the observed flood event would have flushed out most aquatic species due to its size and severity, with or without the proposed Project improvements. Figure

2 illustrates the state of channel conditions in the Santa Clara River along the Project area following the January 2005 flood.

Project Impacts

Project impacts on southwestern pond turtles will probably include temporary or permanent alteration of aquatic channel foraging habitat consequent to construction activities, possible loss of basking areas, but probably no long-term effects from bank stabilization as long as adjacent braids and overflow channels continue to exist. Oviposition habitat on the south bank and downstream will probably not be affected by bank stabilization, but may be temporarily disturbed during future road and bridge development.

The Flood Technical Report for the Landmark Village Project (PACE 2005) found that there would be no significant impacts in water flows, velocities, depth, sedimentation, or floodplain and channel conditions downstream of the Project site as a result of the proposed Project improvements. These hydraulic effects were also found to be insufficient to alter the amount, location and nature of aquatic and riparian habitats in the Project area and downstream into Ventura County. The technical analysis further determined that the river would still retain sufficient width to allow natural fluvial processes to continue; and, as a result, the mosaic of habitats in the river that support various sensitive species would be maintained, and the population of the species within and immediately adjacent to the river corridor would not be significantly affected. Based on that technical assessment, no impacts to adjacent or downstream populations of the southwestern pond turtle are expected.

The Landmark Village Water Quality Technical Report (GeoSyntec 2005) indicates that the modeled concentrations in runoff from developed areas with Project Design Features (PDFs) are below all benchmark water quality objectives and criteria and TMDL waste load allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy. These water quality objectives are established to protect various beneficial uses including general wildlife, sensitive, rare and endangered species.

Therefore, potential impacts from the Project on receiving water quality and beneficial uses in the Santa Clara River are not significant. Based upon that Report, no impacts to adjacent or downstream populations of southwestern pond turtle are expected.

3.5 TWO-STRIPED GARTER SNAKE

Historical and Recent Vicinity Records

Santa Clara River records for the two-striped garter snake in the Newhall Ranch region are absent from the CNDDB and the museum collections, yet the various reports reviewed for this document and personal communications with local biologists indicate that this species occurs somewhat commonly along this reach of the river.

Results of ENTRIX Field Reconnaissance

During the March 31, 2004 survey, the ENTRIX biologists observed one two-striped garter snake near an exposed root mass along the braided confluence of Castaic Creek and the Santa Clara River. Exposed root masses are particularly favored by these snakes because they offer secure shelter and they tend to form small shallow backwater pools where small fish congregate and are easy for the snakes to capture (Barry unpbl. obs.). The November 10, 2004 survey revealed that such isolated complex refugia are very limited along the reach from Castaic Creek to Chiquito Creek, but the survey also revealed that low dense bankside vegetation, another type of favored retreat, occurs almost continuously along the north side of the river from Chiquito Creek upstream nearly to the Wolcott Road crossing. Much of this vegetation is associated with overflow pools that entrap fish during the late spring and early summer, which undoubtedly attracts two-striped garter snakes in greater than typical numbers to exploit this resource. However, subsequent pool drying eliminates this resource and garter snakes consequently disperse, to return during the following spring when the forage resource is renewed (Barry unpbl. obs.).

Following a severe flood event in January 2005, ENTRIX biologists conducted a one-day reconnaissance survey of the Project reach to evaluate the response of habitat conditions. Generally, plant and animal life had been flushed from the active stream channel. Riparian and aquatic vegetation along the stream margins had been scoured. Few or no aquatic insects were observed during numerous spot inspections. The streambed also aggraded in many areas, particularly in backwater pools where significant shallowing or complete filling had occurred. Significant deposition of sand and gravel was also observed in the forms of lateral and mid-channel bars. Most exotic aquatic species appeared to have been flushed out by the flooding events. Based on this survey, the observed flood event would have flushed out most aquatic species due to its size and severity, with or without the proposed Project improvements. Figure 2 illustrates the state of channel conditions in the Santa Clara River along the Project area following the January 2005 flood.

Project Impacts

Project impacts on two-stripe garter snake will be less than significant since the proposed Project's bank stabilization features are set back from the active channel and existing snake habitat. No adverse change to foraging habitat is expected from implementation of the Project.

The Flood Technical Report for the Landmark Village Project (PACE 2005) found that there would be no significant impacts in water flows, velocities, depth, sedimentation, or floodplain and channel conditions downstream of the Project site as a result of the proposed Project improvements. These hydraulic effects were also found to be insufficient to alter the amount, location and nature of aquatic and riparian habitats in the Project area and downstream into Ventura County. The technical analysis further determined that the river would still retain sufficient width to allow natural fluvial processes to continue; and, as a result, the mosaic of habitats in the river that support various sensitive species would be maintained, and the population of the species within and immediately adjacent to the river corridor would not be significantly affected. Based on that technical assessment, no impacts to adjacent or downstream populations of the two-striped garter snake are expected.

The Landmark Village Water Quality Technical Report (GeoSyntec 2005) indicates that the modeled concentrations in runoff from developed areas with Project Design Features (PDFs) are below all benchmark water quality objectives and criteria and TMDL waste load allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy. These water quality objectives are established to protect various beneficial uses including general wildlife, sensitive, rare and endangered species.

Therefore, potential impacts from the Project on receiving water quality and beneficial uses in the Santa Clara River are not significant. Based upon that Report, no impacts to adjacent or downstream populations of two-striped garter snake are expected.

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5. LIST OF PREPARERS

ENTRIX, Inc.

- Matt Carpenter, Senior Project Manager: coordination and management of ENTRIX technical staff through the background document review, field reconnaissance and document preparation phases.

- Camm Swift, Ph.D., Senior Fisheries Scientist: conducted field reconnaissance survey and background document review; prepared technical discussion of issues related to stickleback and fish.

- Sean Barry, M.S., Senior Herpetologist: conducted field reconnaissance surveys and reviewed background documents, site photos and field reconnaissance documentation; prepared technical discussion of issues related to amphibians and reptiles.

- Steve Howard, Senior Staff Fisheries Scientist: assisted field reconnaissance survey and background document review; supported technical discussion of issues related to stickleback and fish.

- Resumes for these preparers are included in Appendix B.

APPENDIX A

FIGURES AND FIELD PHOTOGRAPHS

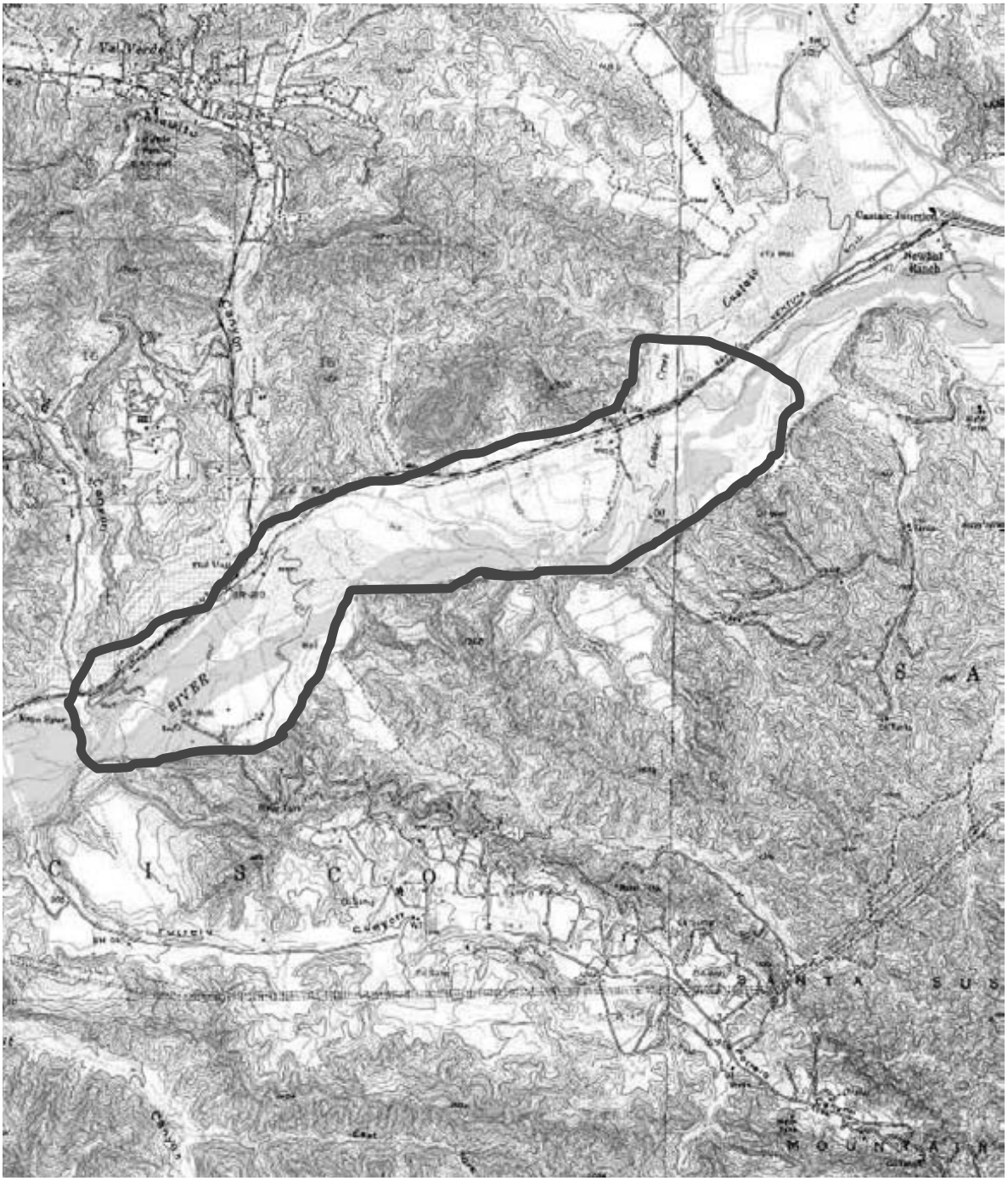

Figure 1. Landmark Village Study Area (Santa Clara River) – Newhall Ranch, California

Figure 2 . Landmark Village Study Area Aerial Photograph (following January 2005 Flooding)

Castaic Creek / Santa Clara River Confluence photographed in November 2004 prior to winter 2005 floods.

Castaic Creek upstream of confluence following January 2005 flood (note vegetation scoured throughout).

Spring 2004 channel conditions at the Landmark Village Project site (facing upstream)

Isolated pool seined for fish and other aquatic vertebrates during the Spring 2004 reconnaissance.

APPENDIX B

RESUMES OF PREPARERS

MATTHEW M. CARPENTER

project management
natural resources management
watershed hydrology & restoration
stream ecology & habitat assessment
environmental impact analysis
wetland delineation & assessment
water quality assessment & protection
stream habitat rehabilitation
environmental permitting
land use planning

EDUCATION

- California Polytechnic State University, San Luis Obispo: B.S., Forestry and Natural Resources, Environmental Management Concentration, 1995

PERMITS AND CERTIFICATION

- United States Army Corps of Engineers Wetland Delineation Training Program, Environmental Technology Center No. 253, 1996
- California Department of Fish and Game. Resident Scientific Collecting Permit No. 801075
- National Marine Fisheries Service. Secton 10(a)1(a) No. 1050 Salmonids Research ENTRIX, Inc.
- Cal-EPA Office of Environmental Health Hazard Assessment. Registered Environmental Assessor I. No. REA-07479

PROFESSIONAL HISTORY

- ENTRIX, Inc., Senior Project Scientist, 1995 to date
- Cal Poly Foundation, Morro Bay National Monitoring Project, Research Assistant, 1994-1995

REPRESENTATIVE EXPERIENCE

Mr. Carpenter is an interdisciplinary scientist with experience conducting a variety of natural resource studies involving an array of complex environmental impact analysis and restoration planning assignments. Mr. Carpenter has managed numerous projects, spanning several technical disciplines incorporating communication with a variety of stakeholder interests. Mr. Carpenter has performed numerous project management, field investigation, and reporting tasks involving a wide variety of projects. Representative projects are presented as follows:

Habitat Assessment and Restoration

- Mr. Carpenter directed activities involving the Tributaries Work Group for the assessment, restoration, and management of endangered southern California steelhead on the lower Santa Ynez River in southern California. The group was comprised of fisheries professionals from the Santa Ynez River Technical Advisory Committee (NMFS, CDFG, USFWS, BOR) developing consensus–based stream habitat enhancement measures for improved steelhead production within the tributaries below Bradbury Dam. The tributaries offer the only viable habitat for steelhead to successfully spawn and oversummer within the lower basin. Enhancement measures

included modification of fish passage impediments, structural instream improvements to provide additional spawning and rearing habitat, and working cooperatively with private landowners to protect existing steelhead habitat. The resultant work product was incorporated into a final Fish Management Plan, outlining the fishery management actions for steelhead recovery in the lower Santa Ynez River. Planning and implementation of five major enhancement efforts are underway.

- Mr. Carpenter recently managed the preparation of a steelhead habitat evaluation for the Matilija Dam Ecosystem Restoration Project. The report supplemented the F3 Feasibility Study prepared by the US Army Corps of Engineers and Ventura County Flood Control District. The F4 Alternatives Analysis studies being scoped, includes analysis of steelhead habitat quality and migration barriers in the upper Matilija basin. Restoration will connect endangered southern California ESU steelhead with nearly 50 percent of its historic Ventura River basin spawning and rearing habitat.

- Mr. Carpenter was the principal investigator for a fish habitat assessment of tributary streams to Lake Casitas in Ventura County, California. Fish habitat within three headwater streams, Coyote, Poplin, and Santa Ana creeks, was evaluated for rainbow trout habitat suitability and general aquatic health for a Bureau of Reclamation Resource Management Plan for the Lake Casitas Open Space Lands. Natural and anthropomorphic migration barriers were also documented and evaluated. In addition, the streams were evaluated for fishery enhancement, including recommended management actions for improving rainbow trout production.

- Mr. Carpenter inventoried steelhead/rainbow trout habitat on Malibu Creek from the mouth to Malibu State Park, upstream of Rindge Dam. Migration barriers, spawning gravel, water temperature, and instream shelter components were documented to characterize steelhead habitat conditions.

- Mr. Carpenter has performed riverine fish habitat mapping techniques, and qualitative habitat suitability evaluation for special-status terrestrial species. Mr. Carpenter has performed habitat typing and evaluation for resident and anadromous salmonids in southern and central California (coastal and mountain) streams. Mr. Carpenter has also performed stream classification utilizing the Rosgen methodology.

- Mr. Carpenter conducted studies of hydrology and geomorphology related to the hydroelectric relicensing of Southern California Edison's Big Creek system in the San Joaquin River watershed. Working collaboratively with resource agencies (USFS, CDFG, SWRCB), the studies inventory and characterize hydrologic and geomorphic conditions present on over 125 miles of the San Joaquin River and its tributaries. The characterization studies include Rosgen Level I and II classifications, as well as collecting USFS R5 Stream Condition Inventory data. The data will be evaluated holistically to prescribe future channel maintenance and sediment management practices.

- Mr. Carpenter served as a technical advisor during a third-party review of the Sequoia National Forest's Cumulative Watershed Effects analysis within the upper Kern River basin. The review included field validation of site monitoring information and general reconnaissance for fish habitat conditions for trout. The monitoring sites were located within active timber management zones to monitor the effects of timber harvest on erosion and downstream sedimentation. The focus of the review was aimed toward issues regarding CWE implementation and monitoring.

- Mr. Carpenter manages a multi-year sediment monitoring study on the lower Kern River below Southern California Edison's Kern River No. 1 hydroelectric diversion dam. The study was initiated in response to the FERC Additional Information Request concerning sediment releases in the lower Kern River and the potential impact to smallmouth bass spawning habitat. Study entailed annual surveys of selected pool habitat cross-sections to monitor channel aggradation and degradation following facility sediment flushing events. In addition, the study involved calculating sediment transport capacity to evaluate appropriate sediment management practices for future operation. Subsequent sediment management plan gained multi-agency support following review.

Environmental Permitting

- Currently, Mr. Carpenter manages FERC relicensing efforts for the United Water Conservation District's Santa Felicia Project on Piru Creek. Santa Felicia Dam forms Lake Piru on Piru Creek, a major tributary to the Santa Clara River. The primary resource issue includes assessment of habitat suitability for steelhead in Piru Creek below the dam. In addition, fate of flows and controlled flow studies have been developed to evaluate steelhead migration conditions in the Santa Clara River downstream of Piru Creek. A variety of special status species studies are slated to document arroyo chub, unarmored three-spined stickleback, Santa Ana sucker, southwestern arroyo toad, California red-legged frog, southwestern willow flycatcher, and least Bell's vireo. Whitewater and angling recreation activities are also major resource considerations. The collaborative relicensing effort involves facilitation of Focus Study Group meetings to develop appropriate resource study plans.

- Mr. Carpenter currently manages a large-scale study characterizing the Santa Clara River estuary for the City of San Buenaventura's Ventura Water Reclamation Facility. The NPDES compliance study focuses on two major components, ambient water quality and the resident macroinvertebrate assemblage. The water quality component characterizes ambient conditions at several stations over a 12-month period to develop a metals translator for dissolved- and total-metals present to better understand the likely bioavailability of metals to resident organisms. The macroinvertebrate bioassessment component involves stratified sampling of several estuarine habitats for benthic macroinvertebrates. The macroinvertebrate bioassessment sampling data characterizes the assemblage diversity and develop relationships between abundance, density, and microhabitat preferences (grain size, salinity tolerances, etc.). The objective of these studies is to support the City and LAWRQCB in the development of defensible site-specific NPDES limits for metals discharged to the estuary.

- Mr. Carpenter is currently engaged in permitting activities involving stream habitat enhancement on the lower Santa Ynez River tributaries. Responsible for enhancement implementation, Mr. Carpenter has been coordinating with several local, state, and federal agencies to ensure compliance with applicable permits and approvals necessary. Examples of enhancement projects are as follows: fish passage impediment (road crossings, drop structures, etc.) modification, instream habitat improvements (pool forming structures, BMPs), and bank stabilization and erosion control (BMPs, bioengineering, revegetation). Mr. Carpenter, as leader of the SYRTAC Tributaries Work Group, has also participated in the development of design concepts.

- Mr. Carpenter has managed several environmental permitting projects which required project area field studies (wetland delineation and biological resource inventories) and reporting to permitting regulatory agencies, including ACOE, USFWS, NMFS, CDFG, and RWQCBs. In addition, he has consulted with numerous agency representatives and developed measures to mitigate impacts to sensitive resources, including the southern California steelhead trout and California Red-legged frog under formal Section 7 consultation and preparation of the Biological Assessments adopted by NMFS/USFWS. Collaboration with agencies resulted in successful permitting of projects where impacts were fully mitigated.

- Mr. Carpenter has conducted several wetland delineations to identify the jurisdiction of ACOE and CDFG for permitting under Section 404 of the Clean Water Act and Section 1600 of the California Fish and Game Code. Field surveys were conducted to evaluate site for presence of hydrophytic vegetation, wetland hydrology, and hydric soils at numerous public works infrastructure facilities in streams throughout California. Reporting included biological resource determination for evaluation of special status species for review by the NMFS, USFWS, and CDFG.

- Mr. Carpenter recently completed management of an ESA compliance project on behalf of the Monterey County Water Resources Agency and Salinas Valley farmers. The project included development of a field surveying methodology to measure and delineate low-flow channel exclusion areas prior to initiating channel maintenance activities. Low flow channel delineation was incorporated to comply with interim channel maintenance guidelines developed by NMFS to protect steelhead migration habitat. Mr. Carpenter's survey methodology was adopted by other biologists within the Salinas Valley working on similar projects.

Affiliations

- American Water Resources Association – Stream Ecology Technical Committee
- American Fisheries Society, Cal-Neva Chapter

Technical Reports

- Avaliable upon request

CAMM SWIFT

fish and fisheries biology
aquatic ecology / habitat restoration
ESA compliance and consultation
environmental monitoring
estuarine and stream ecology
archaeological and paleontological analysis

EDUCATION

- Florida State University, Tallahassee, Florida: Ph.D., Biology (Ichthyology), 1970
- University of Michigan, Ann Arbor, Michigan: M. A., Zoology, 1965
- University of California, Berkeley, California: A.B., Zoology, 1963

PROFESSIONAL HISTORY

- Entrix, Inc., Senior Project Scientist, present
- Independent Consultant, 5 years
- Loyola Marymount University, Visiting, Department of Biology, 3 years
- Natural History Museum of Los Angeles County, Associate Curator of Fishes, 22 years

PROFESSIONAL TRAINING

- Electrofishing Workshop, Smith-Root Company, American Fisheries Society Annual Meeting, Phoenix, Arizona, August 2002
- Workshop on interactive teaching (National Science Foundation supported), Los Angeles Cooperative for Teaching Excellence, California State University, Dominguez Hills, California, Spring 1997

PROFESSIONAL EXPERIENCE

Camm Swift has more than 20 years of experience working on the biology and conservation of freshwater and estuarine fishes of coastal southern California. He has served on the Recovery Teams for the unarmored threespine stickleback and tidewater goby, both federally endangered species, and was an author of the recovery plans for both fish. He has extensive knowledge on the freshwater fishes of coastal southern California, including their biology, requirements for recovery, and habitat restoration needs for improving conservation status. He has major expeditionary experience in the fresh and estuarine waters of the southeastern United States, Pacific coastal Mexico and Costa Rica, the Indus River Delta, Pakistan, and Amazonian Peru. He has extensive field and supervisory experience. He has conducted literature searches, written comprehensive reports and peer-reviewed publications, and served as an expert witness on fishery conservation issues. He has considerable experience in the identification and analysis of archaeological and fossil fish bones from the southeastern United States, southern California, and coastal Pakistan.

RELEVANT EXPERIENCE

Environmental/Civil Engineering

Biology and Distribution of Federally Endangered Tidewater Goby on Vandenberg Air Force Base – California.
Dr. Swift developed a sampling program to assess relative population size and distribution with bimonthly sampling of five coastal lagoons and streams on Vandenberg Air Force Base to define the biological parameters of this fish species on the base. He and several students conducted sampling and preliminary aging with otoliths, and prepared a major report on the biology of the species and recommendations for management of the species on the Base.

Status of Freshwater Fishes - Southern California
Dr. Swift supervised crews of three to six graduate students surveying the esturarine and freshwaters of coastal southern California, and prepared a report of findings for the Department of Fish and Game. The report led to major publication on these fishes, and provided much of the information justifying eventual federal and state listing of the more threatened species.

Distribution, Migration, and Predation on the Federally Threatened Santa Ana Sucker - Santa Ana River, California
Dr. Swift conducted a study of Santa Ana suckers in the middle Santa Ana River in San Bernardino, Riverside, and Orange counties to determine population levels, areas of spawning, distribution of larvae and young-of-the-year fish, possible diversion (and loss) of suckers into settling ponds, and impacts of exotic predatory aquatic organisms on the suckers. Dr. Swift prepared a report that provided basis for several management strategies to improve conditions for the sucker and lead to its eventual recovery. The study included snorkel surveys, three-pass transect population estimates with electroshocking, pit tagging of larger suckers, and developing characters to identify larval suckers.

Dynamics of Estuarine Fish Populations in Small Coastal Lagoons - Camp Pendleton
Dr. Swift conducted periodic fish collections in seven coastal lagoons over 5 years to monitor status and fluctuations in populations of the federally endangered tidewater goby and associated estuarine fish species. He documented the effects of the 1998 El Nino on these populations and their rebound back to "normal." He also documented true metapopulational phenomena among the tidewater goby populations subsequently confirmed by genetic studies.

Fish Communities of Ballona Marsh - western Los Angeles County
Dr. Swift conducted two studies (Natural History Museum of Los Angeles County in 1980-81 and San Marino Environmental Associates in 1997-98), each consisting of a series of collections over a 1-year period, to describe the existing fish communities, document changes over time, and recommend measures for long-term management of the marsh for native fishes.

Management Plan for Exotic Aquatic Organisms - Camp Pendleton
Dr. Swift prepared a comprehensive report on the distribution and status of exotic aquatic species on the base, and proposed many measures for their management and control.

Management and Control of Exotic Aquatic Organisms - Haines Creek-Lower Big Tujunga Wash, Los Angeles County
Dr. Swift is conducting a 5-year effort to remove or control exotic fishes, amphibians, turtles, and crayfish in this 1.7-kilometer stream and two associated ponds. A wide variety of methods are being utilized, including gill nets, various traps, removal of frog egg masses, seining, and snorkeling to spear fish and disrupt nesting basses and sunfishes. Dr. Swift is monitoring native fish populations to assess the effects of exotic control efforts by performing stratified random sampling of 16 transects in the stream.

Steelhead Surveys and Monitoring - Vandenberg Air Force Base, CA
Using methods based on the California Department of Fish and Game Salmonid Stream Restoration Manual, Dr. Swift provided comprehensive steelhead habitat description and assessment on five smaller drainages. The project included complete habitat typing of all five streams, snorkel and visual surveys for steelhead and other native fishes, upstream and downstream trapping during the winter migratory period, and historical research.

Advise Six-Agency Committee on Quality and Rationale for Critical Habitat Designations for Endangered Big River Fishes in the Colorado River - Southwestern United States
Dr. Swift conducted comprehensive historical research on the biology of four fishes and analysis of their needs for determining the validity and justification for the U.S. Fish and Wildlife Service Critical Habitat designations and how they might affect operations of the MWD.

Expert Witness on Coastal Minnow/Sucker Community – Southern California
Dr. Swift provided extensive and detailed information on the biology of these fishes to support the California Department of Fish and Game's position of the extreme importance of the wash habitat for their continued existence. The surviving remnant fish community consisted of the Santa Ana sucker (federally threatened) and Santa Ana speckled dace and arroyo chub, both California species of special concern.

AFFILIATIONS

- American Fisheries Society, President-Elect, President, and Past President, Cal-Nevada Chapter, 1996-1998
- American Society of Ichthyologists and Herpetologists
- Estuarine Research Federation (including recently formed California Estuarine Research Society [CAERS])
- Southern California Academy of Sciences, Secretary, President and Fellow, 1985-1991
- Society of Vertebrate Paleontology
- Western Field Ornithologists
- California Native Plant Society
- American Association for the Advancement of Science
- Sigma Xi

PUBLICATIONS AND PRESENTATIONS

Swift, C. C., J. S. Nelson, C. Maslow, and T. Stein. 1989. Biology and distribution of the tidewater goby, Eucyclogobius newberryi, (Pisces:Gobiidae) of California. Nat. Hist. Mus. Los Angeles Co., Contrib. Sci., 404, 19 pp.

Swift, C. C. 1989. Late Pleistocene freshwater fishes from the Rancho La Brea deposit, southern California. Bull. S. Calif. Acad. Sci., 88(3):93-102.

Imber, M. J., J. B. Cruz, J. S. Grove, R. J. Lavenberg, and C. C. Swift. 1992. Feeding Ecology of the dark-rumped petrel in the Galapagos Islands. The Condor, 94(2):437-447.

Swift, C. C., T. R. Haglund, R. Fisher, and M. Ruiz. 1993. Status and distribution of the freshwater fishes of southern California. Bull. S. Calif. Acad. Sci. 92(3):101-167.

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Lafferty, K., R. Swenson, and C. C. Swift. 1996. Tidewater goby; endangered species profile. Environmental Biology of Fishes, 46:254.

Lafferty, K., Swift, C. C., and R. Ambrose. 1999a. Post flood persistence and recolonization of the endangered tidewater goby populations. North American Journal of Fisheries Management, 19(2):618-622.

_____. 1999b. Extirpation and recolonization in a metapopulation of an endangered fish, the tidewater goby. Conservation Biology, 13(6):1447-1453.

Swift, C. C., K. Hieb, and R. Swenson. 2002. Family Gobiidae, pp. 7-9. IN: William S. Leet, Christopher M. Dewees, Richard Klingbeil, and Eric J. Larson (editors), California's Living Marine Resources: A status report. The Errata. California Department of Fish and Game, Sacramento, CA (December, 2001). The larger work appeared in early 2002 lacking the Gobiidae Chapter due to editorial error; it was included in the Errata subsequently printed and added to the Web edition [www.dfg.ca.gov/mrd]

Dawson, M. N., K. D. Louie, M. Barlow, D. K. Jacobs, and C. C. Swift. 2002. Comparative phylogeography of sympatric sister species, Clevelandia ios and Eucyclogobius newberryi (Teleostei, Gobiidae), across the California transition zone. Molecular Ecology, 11:1065-1075.

Swift, C. C. and D. Holland. 2002. Exotic fish species and their impacts on small coastal lagoons in southern California. (Abst.). Bull. S. Calif. Acad. Sci., 101(2), Supplement, p. 32.

Swift, C. C. 2002. Interaction between native fish, habitat, and exotic species in the middle Santa Ana River, southern California. (Abst.), Bull. S. Calif. Acad. Sci., 101(2), Supplement, p. 32.

SEAN J. BARRY

zoology/herpetology
ecology/mammalogy
molecular biology
regulatory compliance

EDUCATION

- University of California, Davis, B.S., Zoology
- University of California, Davis, M.S., Zoology
- Thesis: The Distribution, Habitat, and Evolution of the San Francisco Garter Snake, *Thamnophis sirtalis tetrataenia*

REGISTRATION

- California Department of Fish and Game scientific collecting permit #000131, mammals, fish, reptiles, amphibians, invertebrates, California species of special concern, expires May 2005
- Section 10A US Fish and Wildlife Service Endangered Species Recovery Permit, #TE 827500, for distribution-wide studies of the California red-legged frog (*Rana aurora draytonii*), the giant garter snake (*Thamnophis gigas*), and the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*). Expires 12/31/2006.

PROFESSIONAL HISTORY

- ENTRIX Inc, Project Scientist/Herpetologist, 2003 to date
- Independent Consultant/Herpetologist, 1974 to 2003
- Staff Research Associate, University of California, Davis, 1983 to 2003
- Curator of the Vertebrate Museum, Department of Zoology, University of California, Davis, 1972 to 1975
- Biologist, California Department of Fish and Game, Endangered Species Program Reptiles and Amphibians office, 1972 to 1975

PROFESSIONAL EXPERIENCE

Mr. Barry has more than 28 years of experience working with agencies and consulting firms on investigations of State and federally listed (threatened/endangered) California reptiles and amphibians, for refuge development, urban impact assessments, and evaluation of conservation status of individual populations. He is a nationally recognized authority on the endangered San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) and has also recently completed studies of special-status (e.g., Sierra Nevada) California red-legged frog populations (*Rana aurora draytonii*). His scientific background also includes projects related to molecular systematics (microsatellite and single nucleotide polymorphism analysis) and molecular biology of regulated genes (targeted gene studies, gene expression analysis, etc). Responsibilities have included project and safety management, budget planning, all aspects of field and laboratory technical work, grant and proposal preparation, and teaching/mentorship.

AFFILIATIONS

- Ecological Society of America
- American Society of Mammalogists

- American Society of Ichthyologists and Herpetologists
- Society for the Study of Amphibians and Reptiles
- Herpetologists' League
- Society for Systematic Biology
- Society for the Preservation of Natural History Collections

REVIEWS

- San Francisco Garter Snake Recovery Plan, US Fish and Wildlife Service, 1983-85.
- California Red-Legged Frog Recovery Plan, US Fish and Wildlife Service, 2000-2002.
- Check-list of Amphibians, Reptiles, Birds, and Mammals of California, California Department of Fish and Game
- "Measuring and Monitoring Biological Diversity" book series (mammals, amphibians, reptiles), Smithsonian Institution Press. February 2000-present
- Journal of Herpetology, 1998-present

SELECTED PUBLICATIONS

Barry, S.J. 1976. Investigations on the occurrence of the San Francisco garter snake at the Stanford Linear Accelerator Center. SLAC Tech. Note 76-2, 6 p.

Barry, S. J. 1978. The status of the San Francisco garter snake. California Department of Fish and Game Endangered Species Special Publ. 78-2. 20 p.

Barry, S. 1993. The San Francisco garter snake: protection is the key to recovery. Tideline 13:1-3,15.

Barry, S. J. and H. B. Shaffer. 1994. The California tiger salamander at Lagunita: a 50-year update. Journal of Herpetology 28:159-164.

Barry, S. J. and M. Mangel, 1994. Review of Harrison, L. Kinetic Theory of Living Pattern. Mathematical Biosciences. 124:237-241.

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Submitted

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STEVEN R. HOWARD

aquatic invertebrate ecology
fisheries biology
habitat assessments and mapping
instream flow analysis/IFIM
limnology
salmonid biology
stream and estuarine ecology
water quality assessment
environmental monitoring

EDUCATION

- Humboldt State University, Arcata, CA: B.S., Fisheries, 1999
- Ventura College, General Education, Biology & Mathematics 1993-1994
- Cuesta College, General Education, Biology & Mathematics 1992-1993

PERMITS, CERTIFICATION AND ADDITIONAL TRAINING

- California Department of Fish and Game. Resident Scientific Collecting Permit No. 801226-04
- USFWS Project Permitted Tidewater Goby Specialist in Ventura and Santa Cruz Counties
- Theory and Application of the Physical Habitat Simulation System, Utah State University, May 2002
- Sampling Theory and Design Workshop, Humboldt State University, March 2002
- Aquatic Ecological Assessment Workshop, CDFG, March 2002

PROFESSIONAL EXPERIENCE

Mr. Howard is an interdisciplinary scientist with an emphasis on aquatic studies including fishery habitat assessment and population surveys, fish species identification, fisheries techniques, fish passage assessment, fish and aquatic invertebrate population analysis, water quality assessment, and wildlife population and escapement surveys. Mr. Howard has preformed numerous projects in aquatic habitats ranging from high elevation lakes and streams to coastal estuaries. Mr. Howard has also conducted projects including subsurface soil and groundwater investigations, environmental impact studies, environmental monitoring, and site closure and remediation. Mr. Howard has been involved in permitting large power projects and smaller instream projects throughout California.

Fish Population Studies

Mr. Howard has conducted numerous fish population studies throughout many of the western states. Representative projects include chinook, steelhead and bull trout studies in northern California and Oregon, steelhead studies in central and southern California, various trout species studies in California, Oregon and Idaho, and native fish studies in Oregon and southern California. Mr. Howard has also conducted fish population surveys in southern and central California estuaries for the endangered tidewater goby.

RELAVENT EXPERIENCE

Fish and Wildlife Studies

- **McKenzie River Watershed Spring Chinook Population Study** – Lane County, OR
  Mr. Howard conducted chinook salmon spawning surveys, obtained biological samples from spawned-out salmon, collected downstream migrants, monitored fish passage though leaburg dam, and monitored bull trout migration under the Western Oregon Research and Monitoring Program. Mr. Howard conducted these projects for the Oregon Department of Fish and Wildlife.
- **Oregon State Elk Population Study** – Lane County, OR
  Mr. Howard managed an initial statewide effort to obtain elk teeth and tissue samples throughout the state of Oregon. This effort was successful and set precedent for future Oregon Department of Fish and Wildlife elk tissue collection efforts.
- **United Water Conservation District FERC Relicensing Project** – Ventura County, CA
  ENTRIX, Inc. designed multiple studies under agency consultation during the FERC application process. Mr. Howard conducted fish population studies and identified fish species present in Piru Creek below Santa Felecia Dam, within Piru Lake and above the lake in Piru Creek.
- **United Water Conservation District Steelhead Migration Project** – Ventura County, CA
  ENTRIX, Inc. directed fish passage monitoring and fish rescue consultation involving steelhead on the lower Santa Clara River. Mr. Howard was the lead fisheries biologist for the project. The Vern Freeman Diversion fish passage facility includes a fish ladder, fish screens, and a downstream migrant fish trap. During steelhead migration, facilities at the diversion were inspected for stranded steelhead and resident rainbow trout for relocation to the appropriate habitat. These operations were interim mitigation measures for section 10 incidental steelhead take.
- **PacifiCorp FERC Relicensing Project** – Jackson County, OR
  ENTRIX, Inc. conducted numerous aquatic studies under agency consultation during the FERC reliscencing application process. Mr. Howard analyzed fish population data in the upper Rogue River watershed to estimate salmonid population densities above and below dams.
- **Moyie River Fish Population Study** – Bonner County, ID
  ENTRIX, Inc. conducted a salmonid relative abundance survey in the Moyie River in Idaho. The survey was performed utilizing four divers at several gas pipeline river crossings. This was conducted in conjunction with past monitoring and a proposed expansion of the pipeline at the crossings in the Moyie River. Mitigation for each crossing consisted of installing Riprap wings to prevent bank Scour and rock-drop structures to form rearing and holding pools.
- **Ventura County Flood Control Tidewater Goby Project** – Ventura County, CA
  ENTRIX, Inc. served as fisheries professional to the Ventura County Flood Control District during pipe maintenance in the Hueneme drain. A temporary impoundment was placed around the work area which trapped numerous fish including tidewater gobies. Mr. Howard identified fish species within the impoundment and relocated all fish away from the work area.
- **Ventura County Flood Control Bank Stabilization Project** – Ventura County, CA
  ENTRIX, Inc. served as fisheries professional for Ventura County Flood Control District during a bank stabilization and habitat restoration project on the Sespe River.

Mr. Howard was in charge of identifying fish species for relocation outside of the project boundary.

- **San Clemente Dam Retrofit Drawdown Project –** Monterey County, CA
  ENTRIX, Inc. is conducting annual fish rescues upstream of San Clemente Dam and fish trapping and relocation activities to appropriate habitats downstream of San Clemente Dam for California-American Water Company. Water quality monitoring was also an important part of this project during the drawdown activities. Dissolved oxygen can drop dramatically during these types of projects. Aerators were installed throughout the reservoir to maintain adequate DO levels during the project. A low percentage of steelhead mortalities occurred during this project. Mr. Howard conducted fish rescues and relocations and water quality monitoring during this project. Mr. Howard was one of a few biologists permitted by NOAA Fisheries to conduct electrofishing and fish relocation activities during this project.
- **Haines Creek Native Fish Population Monitoring and Exotic Species Removal Project –** Los Angeles County, CA
  ENTRIX, Inc. is involved in a multi-year fish population monitoring project on Haines Creek. Haines Creek is one of a few creeks that has sustaining populations of Santa Ana suckers and Santa Ana speckled dace. Numerous exotic species are also found in Haines Creek such as largemouth bass, green sunfish, mosquito fish and crawfish. Sampling is conducted by a 2-pass seining method in 200-meter sample sites.
- **San Lorenzo River Steelhead and Tidewater Goby Relocation Project –** Santa Cruz County, CA
  ENTRIX, Inc. conducted steelhead and tidewater goby rescue and relocation activities during a bank stabilization project in the tidally influenced reach of the San Lorenzo River. A portadam was constructed around the work area and water was pumped out the impoundment. During fish rescue operations, Mr. Howard discovered the first known tidewater goby in the San Lorernzo River, which prompted further consultation to complete the project. Entrix, Inc. assisted in expediting this consultation process with the USFWS and NOAA Fisheries by monitoring water quality within the impoundment and describing tidewater goby habitat and in the San Lorenzo River.

Habitat Assessment Studies

- **Habitat Typing Projects** – California and Oregon
  ENTRIX, Inc. performs numerous habitat typing investigations for multiple clients throughout the United States. Mr. Howard has performed habitat typing field projects in northern California coastal rivers and in mountain streams in southern California and Oregon.
- **Steelhead Habitat and Passage Assessment** – Ventura County, CA
  ENTRIX, Inc. conducted a steelhead habitat and passage assessment for the City of Ventura to be included in the Ventura River Habitat Conservation Plan. Mr. Howard was the lead fisheries biologist in charge of assessing steelhead habitat on North Fork Matilija Creek. A diversion facility on the Ventura River currently blocks access to headwater steelhead habitat in North Fork Matilija Creek and its tributaries. A fish passage facility is planned for construction in the near future allowing upstream migration to important steelhead habitat in the North Fork Matilija. This habitat assessment quantified spawning and rearing habitat for southern California steelhead trout.
- **Matilija Creek Steelhead Habitat Evaluation** – Ventura County, CA
  ENTRIX, Inc. conducted a steelhead habitat evaluation for the Matilija Dam Ecosystem Restoration Project. Mr. Howard assisted a project team during this evaluation. The report supplemented the F3 Feasibility Study prepared by the US Army Corps of Engineers and Ventura County Flood Control District. The Matilija Dam

project is the largest dam removal and restoration activity ever proposed in California. Restoration will connect endangered southern California ESU steelhead with nearly 50 percent of its historic Ventura River basin spawning and rearing habitat.

- **Salsipuedes Creek Fish Passage Project** – Santa Barbara County, CA
  ENTRIX, Inc. modified an existing concrete apron to provide for fish passage along Salsipuedes Creek near Lompoc, California. Responsibilities included surveying, conducting site reconnaissance studies, preparing design drawings, permit information, and a grant application, and construction oversight. Mr. Howard assisted the project engineer on anadromous fish passage criteria for the project.

Bioassessment and Invertebrate Studies

- **Olympic View Sanitary Landfill Wetland Evaluation** – Kitsap County,WA
  ENTRIX, Inc. conducted statistical analysis of previously collected data to evaluate relationships between chemical and physical water parameters and the abundance and diversity of macroinvertebrates in a wetland adjacent to the landfill.
  Stepwise regression analysis attempted to correlate species abundance and richness with water quality and chemistry to assess localized impacts. Mr. Howard conducted this statistical analysis and assisted the project team with the final report.
- **Santa Clara River Estuary Bioassessment** – Ventura County, CA
  ENTRIX, Inc. designed and conducted this bioassessment study which involved stratified sampling of several estuarine habitats for benthic macroinvertebrates in the Santa Clara River Estuary. Mr. Howard was the lead field biologist on this project. The macroinvertebrate data characterized the assemblage diversity and develops relationships between species abundance, density, richness and microhabitat preferences (grain size, salinity tolerances, etc.). The objective of this study was to support the City and LAWRQCB in the development of defensible site-specific NPDES limits for metals discharged to the estuary.
- **Big Creek FERC Relicensing Bioassessment Project** - Sierra National Forest, CA
  ENTRIX, Inc. performed this study under agency consultation for the SCE Big Creek FERC relicensing application process. Mr. Howard was a lead biologist on this bioassessment project. The project was conducted in a large portion of the South Fork San Joaquin River watershed. Macroinvertebrate sampling occurred above and below large dams and small diversions to assess Southern California Edison project impacts.

Instream Flow Studies/PHABSIM Modeling

- **United Water Conservation District FERC Relicensing IFIM Project** – Ventura County, CA
  ENTRIX, Inc. conducted an instream flow study to determine the impacts of Santa Felicia Dam on the steelhead habitat in Piru Creek. Mr. Howard lead a crew comprised of client staff and sub-contractors.
- **United Water Conservation District FERC Relicensing Steelhead Migration Project**– Ventura County, CA
  ENTRIX, Inc. conducted a migration study on the Santa Clara River downstream of Piru Creek to determine adequate flow releases that would facilitate steelhead upstream migration to Piru Creek.
- **Ventura River IFIM Project** – Ventura County, CA
  ENTRIX, Inc. conducted this instream flow study to determine the impacts of dams and diversions on the steelhead habitat in the Ventura River. The results of this study will assist in the identification of factors potentially limiting fish populations in the effected reaches of the Ventura River and to determine appropriate minimum instream flows. Mr. Howard conducted the field investigation, PHABSIM Modeling

and produced the final report. Instream Flow Incremental Methodology (IFIM) studies in Oregon and California including the Ventura River. These projects use multiple flow regimes in determining fish habitat suitability downstream from dams and diversions.

- **Matilija Creek IFIM Project** – Ventura County, CA
  ENTRIX, Inc. conducted this instream flow study to determine the impacts of releases from Matilija Dam on Steelhead rearing and spawning habitat from the dam to the Robles Diversion on the Ventura River. The results of this study will assist in the identification of factors potentially limiting fish populations in the effected reach and to determine appropriate release flows and ramping rates. Mr. Howard conducted the field investigation, data collection, and modeling setup.
- **PacifiCorp FERC IFIM Project** – Jackson County, OR
  ENTRIX, Inc. conducted this instream flow study to determine the impacts of dams and diversions on fisheries habitat in the upper Rogue River watershed. Mr. Howard assisted in the field investigation and data collection.

Water Quality Studies

- **Santa Clara River Estuary Metals Translator Study** – Ventura County, CA
  ENTRIX, Inc. conducted a yearlong investigation focused on determining the metals translators for copper, nickel, zinc, and lead in the Santa Clara River Estuary. There are chemical differences between the Ventura Water Reclamation Facilities (VWRF) discharged effluent and the receiving Santa Clara River water. The Metals Translator Study determined what fraction of metals in the VWRF effluent were dissolved in the receiving water, and therefore bioavailable. Mr. Howard was the lead investigator on the Santa Clara River Estuary Metals Translator Study for the City of San Buenaventura.
- **Big Creek FERC Relicensing Water Quality Project** – Sierra national Forest, CA
  ENTRIX, Inc. conducted a water quality study related to the hydroelectric relicensing of Southern California Edison's Big Creek system in the San Joaquin River watershed. Study sites were selected by ENTRIX and a combined agency working group targeting large reservoirs, small impoundments, and streams below project facilities. Mr. Howard was in charge of multiple sampling teams working throughout the San Joaquin watershed.

Environmental Monitoring

- **360 Networks Fiber Optics Project** – Modoc, Lassen, Tehama, Glenn, Butte, Yuba, and Sutter Counties, CA
  ENTRIX, Inc. monitored fiber optic installation that occurred within a variety of sensitive habitats including rivers, wetlands, vernal pools, caves, and cultural resource areas. Many species listed under the California and Federal endangered species acts were of special concern on this project. Mr. Howard was the lead environmental monitor on this fiber optics project for the California Public Utilities Commission. No significant environmental impacts, under the adopted environmental mitigation measures, occurred on this project.
- **Southern Trails Gas Pipeline Project** – Riverside County, CA
  ENTRIX, Inc. monitored fiber optic installation that occurred within a variety of sensitive dessert habitats including rivers, washes, reptile and bird habitats, and cultural resource areas in the Mojave Dessert near Palm Springs, California. Mr. Howard was the Lead Field Coordinator for the California State Lands Commission on this project. The pipeline right-of-way was 8 miles long which crossed numerous washes including the San Gorgonio River. No significant environmental impacts, under the adopted environmental mitigation measures, occurred on this project.
- **Ventura County Flood Control Sediment Removal–** Ventura County, CA

ENTRIX, Inc. monitored a sediment removal and channel maintenance project on Pole Creek in Fillmore, California. Mr. Howard served as fisheries professional and Environmental Monitor to the Ventura County Flood Control District on this project. This creek is a tributary to the Santa Clara River which supports a small population of endangered southern California steelhead trout. Mr. Howard assessed steelhead habitat quality and steelhead migration barriers. Additionally, Mr. Howard monitored construction to eliminate the possibility of project related steelhead impacts.

PROFESSIONAL HISTORY

- ENTRIX, Inc. Senior Staff Scientist, 2003 to date
- ENTRIX, Inc. Staff Scientist, 2000 to 2003
- Oregon Dept. of Fish and Wildlife, 1998

AFFILIATIONS

- American Fisheries Society, Oregon and Cal-Neva Chapters since 1998
- Trout Unlimited

Compliance Biology, Results of Focused Western Spadefoot Toad Surveys

compliance•biology inc

November 3, 2004

Mr. Glenn Adamick
Newhall Land Company
23823 Valencia Boulevard
Valencia, CA 91355

Subject: Results of Focused Western Spadefoot Toad Surveys on the River Village Project Site and Associate Borrow Sites

Dear Mr. Adamick,

The purpose of this letter report is to provide you with the results of focused surveys for the western spadefoot (*Spea* [Scaphiopus] *hammondii*) conducted on the River Village project site and its associate borrow sites located in an unincorporated area of Los Angeles County, California.

BACKGROUND

The western spadefoot is a small toad that is currently considered by California Department of Fish and Game (CDFG) as a California Species of Special Concern. This status does not afford the species protection under the state Endangered Species Act, but impacts to the species from projects are considered when those projects are reviewed under the California Environmental Quality Act (CEQA).

Western spadefoot toad adults only enter aquatic habitats for breeding. They spend most of the year in a dormant to semi-dormant state in small mammal burrows in upland habitat adjacent to seasonal rainpools. This species requires seasonal rainpools that last a minimum of four weeks as eggs take from 1 to 6 days to hatch and metamorphosis can be completed within 3 to 11 weeks (Jennings and Hayes 1994). Breeding habitat must be seasonal such that predators including bullfrogs and predatory fish do not become established. Breeding adults typically emerge during and/or immediately following relatively warm rains in late winter to early spring. Female western spadefoot toads deposit small clusters of 10 to 42 eggs to plant stems or other debris in the pool (Jennings and Hayes 1994).

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In spring 2004, around the time of these surveys, breeding populations of western spadefoot toads were identified in three areas of Newhall Land holdings. Three populations were identified on the River Park project site approximately 5.2 miles to the east, one population was identified on the West Creek project site approximately 4 miles to the northeast, and one population was identified on the Valencia Commerce Center site approximately 1.5 miles to the north.

In an effort to ensure impacts to this species are avoided or minimized, Newhall Land directed Compliance Biology to perform focused surveys throughout the remaining project areas within their holdings. The River Village project is one of those areas.

The concurrent surveys on the other Newhall project sites in the area suggest the likely presence of western spadefoot toad on the Mesas West project site approximately 0.5 miles to the east of the south borrow site and 0.25 miles south of the River Village site, on the Mesas East project site approximately one mile southeast of the River Village site and 1.5 miles east of the south borrow site, and approximately 1.5 miles south of the south borrow site on the Portrero Valley project site.

METHODOLOGY

On March 9, 2004 Compliance Biology biologists surveyed the River Village project site and on March 23, 2004 the associated borrow sites were systematically transected for the purpose of evaluating the potential presence of western spadefoot toad. All of the flat lowland portions of the site were methodically walked and hilltops were utilized as vantage points to survey remaining areas for standing water. Additionally, all dirt roads were surveyed as western spadefoot toads are known to utilize deep road ruts that fill with rainwater (personal observation).

Surveys were conducted during the known breeding season for this species as evidenced by the identification of other breeding populations in the region. Although temperatures following the last rain of the season had increased dramatically, resulting in the rapid evaporation of potentially suitable breeding pools, it is expected that if western spadefoot were present on site, there would still be visible evidence detectable at the time of surveys.

EXISTING CONDITIONS

The project area is located in Los Angeles County (Exhibit 1). The River Village project site is situated south of SR 126 along the north side of the Santa Clara River. The north borrow site is

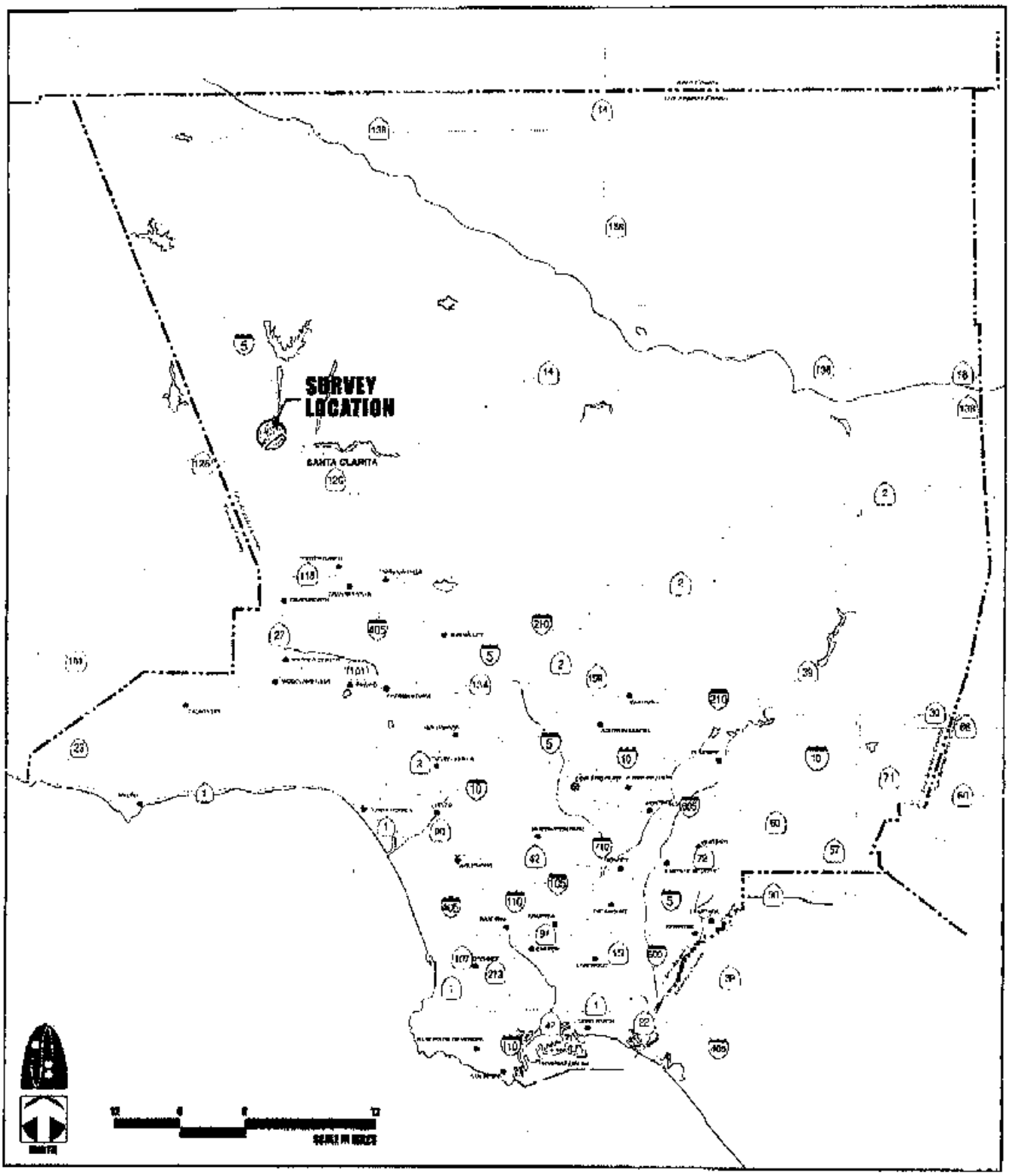


figure 1
Regional Location

situated northwest and adjacent to the River Village site, on the north side of SR 126 east of Chiquito Canyon Road. The south borrow site is located opposite the project site on the south side of the river (**Exhibit 2**).

The River Village project site totals approximately 292.5 acres and is currently under active agriculture with seasonal row crops. As a result, the majority of the land area within the project boundaries are regularly disked and planted. Topography is essentially flat and riparian vegetation occurs along the southern project boundary. A series of dirt roads provide access around and across the site.

The north borrow site totals approximately 25.2 acres and is characterized by variable topography including relatively steep slopes. Vegetation on the north borrow site includes a combination of coastal sage and chaparral scrub species.

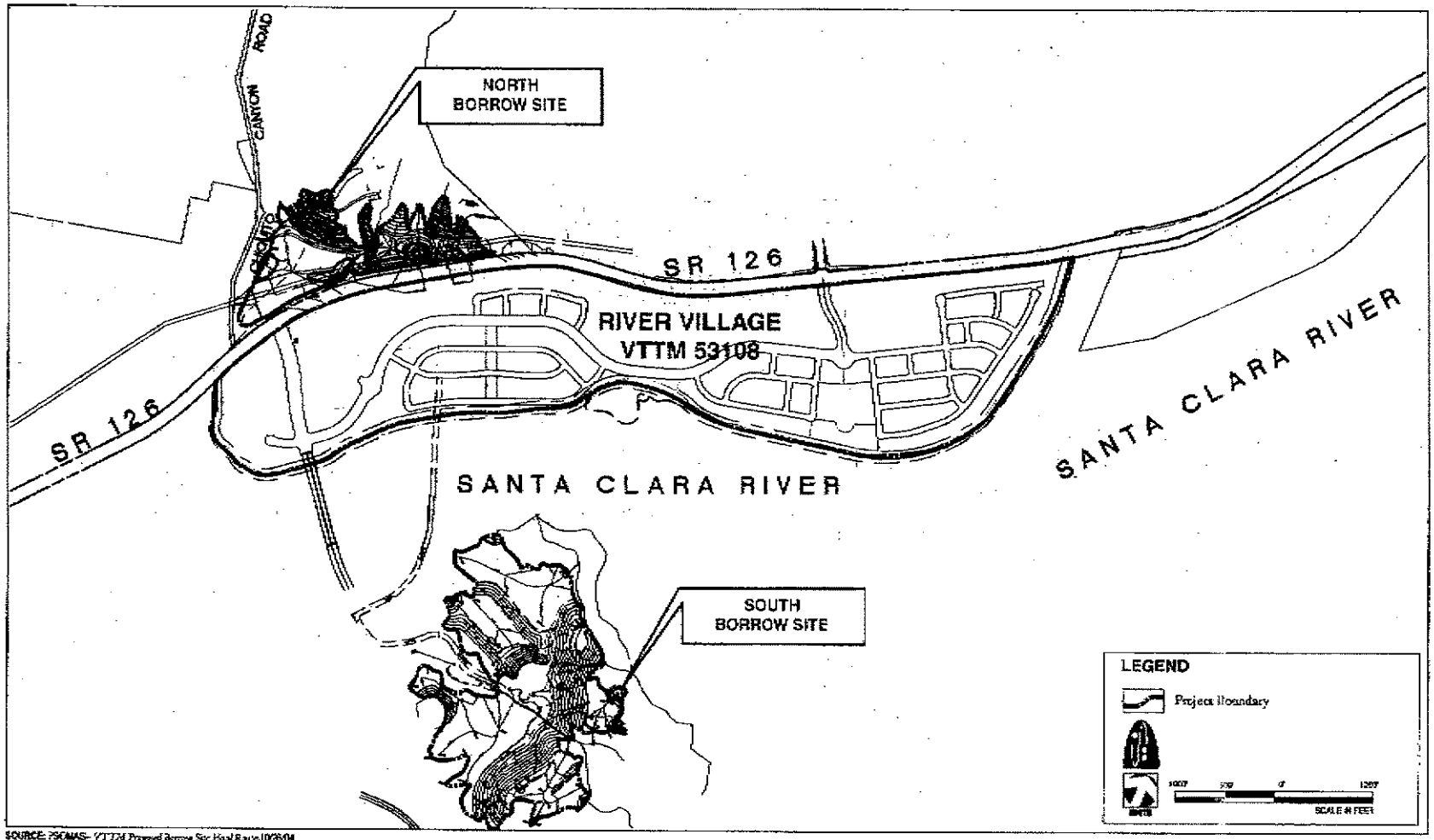
The south borrow site totals approximately 84.6 acres and also supports variable topography with steep slopes and scrub vegetation. Several dirt roads occur throughout this site and a flat mesa occurs near the central portion of site. Areas within this flat area appear to have been historically scraped and are devoid of vegetation.

RESULTS

Five depressions were observed on the River Village project site that either still supported standing water, or cryptogammic soils (crusting layer with indications of algae and silt sediments), suggesting that they held standing water in the recent past. All of the depressions occurred within existing dirt roads and those still supporting surface water appeared to be either a result of, or persistent because of the irrigation system that provided water for the agricultural crops. There were no direct observations or indications of the presence of western spadefoot at any of these depressions.

The north borrow site did not support any depressions that either still held surface water or that appeared to have recently supported surface water for any extended period of time. Soils in this area were mostly sandy and there was no evidence of any areas that would be expected to support seasonal rainpools suitable for breeding western spadefoot toads.

As described, the south borrow site has several dirt roads and a flat cleared area. One depression supporting cryptogammic soils was observed in a dirt road and two depressions with shallow surface water were observed within the flat mesa. There were no direct observations or indications of the presence of western spadefoot at any of these depressions.



SOURCE: PSOMAS- VTTM Proposed Borrow Site Haul Route 10/28/04

exhibit 2
PROJECT LOCATION

CONCLUSIONS

The results of the focused surveys indicate that the depressions occurring on the River Village project site and the south borrow site did not provide any evidence of breeding western spadefoot toads. There were no adults, egg masses, tadpoles, or new metamorphs observed and no indications that they have occurred on this site. Further no western spadefoot toads or suitable conditions for breeding spadefoot toads were apparent on the north borrow site. As such, the potential for spadefoot toad occurrence at the south borrow site is not expected.

Because of the recent documented occurrences of this species in the area, occurrence of western spadefoot toads on the River Village site and south borrow site cannot be entirely ruled out. However, because surveys were conducted during the peak breeding season and no evidence of their presence was detected, their potential for occurrence on these properties is considered low.

RECOMMENDED ACTIONS

To ensure no western spadefoot toads would be impacted by grading or other site preparations, a final focused survey should be conducted on the River Park site and south borrow site during the next late winter or early spring rains to fully determine presence or absence. Should the species be determined to be absent, no further action would be required. Should evidence of western spadefoot toad be discovered within either of the subject areas, the applicant should consult with CDFG regarding possible relocation of the animals to adjacent open space areas.

Please feel free to contact me if you have any questions regarding the information provided in this report.

Sincerely,

Dave Crawford
President/Principal Biologist

REFERENCES

California Natural Diversity Data Base (CNDDB). Wildlife & Habitat Data Analysis Branch. Department of Fish and Game. August 1, 2004. Commercial Version. Newhall and Val Verde, California USGS 7.5-minute quadrangle maps.

CDFG. 2003. Special Animals. State of California, The Resources Agency, Department of Fish and Game, Natural Heritage Division, Natural Diversity Data Base, January 2003 update.

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Stebbins, R. C. 1985. *Western Reptiles and Amphibians.*, 2nd Ed. Houghton-Mifflin Company. Boston, Massachusetts.

Compliance Biology, Results of Focused Surveys for Arroyo Toad and Special-Status Aquatic Reptiles and Amphibians

Results of Focused Surveys for Arroyo Toad and Special-Status Aquatic Reptiles and Amphibians River Village Project; Newhall Ranch, Valencia, California

Prepared for:

Newhall Ranch Company
23823 Valencia Boulevard
Valencia, California 91355

Prepared by:

Compliance Biology, Inc.
1936 N. Croydon Avenue
Camarillo, California 93010

October, 2004

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Appendix A – USFWS Survey Protocol for Arroyo Toad

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Results of Focused Surveys for Arroyo Toad and Special-Status Aquatic Reptiles and Amphibians River Village Project; Newhall Ranch Valencia, California

The following presents the findings of focused protocol surveys that were conducted to determine the presence/absence of the federally-listed Endangered arroyo toad (*Bufo californicus*) within portions of the Santa Clara River adjacent to the River Village project. This report is intended to provide project specific biological information to Newhall Ranch Company, U.S. Army Corps of Engineers (ACOE) and U.S. Fish and Wildlife Service (FWS) regarding results of focused surveys for arroyo toad and additional special-status amphibians and aquatic reptiles including southwestern pond turtle (*Clemmys marmorata pallida*) and two-striped garter snake (*Thamnophis hammondi*) conducted on the subject site.

INTRODUCTION

The survey reach is located in northwest Los Angeles County (**Figure 1**). The River Village project area that is the subject of this report was included as part of a larger scale protocol survey conducted in potentially suitable habitat in portions of the Santa Clara River and adjacent uplands from approximately 1200 feet east (upstream) from the confluence with Castaic Creek, west (downstream) approximately seven (7) miles to the Las Brisas Bridge crossing in eastern Ventura County. The area surveyed on and adjacent to the River Village project site is illustrated in **Figure 2**. The survey area is situated within the Newhall, California U.S. Geological Survey (USGS) 7.5-minute quadrangle map.

General Arroyo Toad Background

The arroyo toad is a small (generally 2 to 3 inches in snout to vent length), light greenish gray or tan toad with warty skin and dark spots. Its underside is white or buff colored without spots. A light-colored stripe crosses the head and eyelids, and a light area usually occurs on each sacral hump and in the middle of the back (FWS, 1994). The arroyo toad does not have the prominent white dorsal stripe characteristic of the commonly occurring western toad (*Bufo boreas*).

The arroyo toad was listed as a federally Endangered species by the FWS on December 16, 1994 (50 CFR Part 17). The arroyo toad is also considered a Species of Special Concern by the California Department of Fish and Game (DFG) and a Protected Amphibian under the state Fish and Game Code.

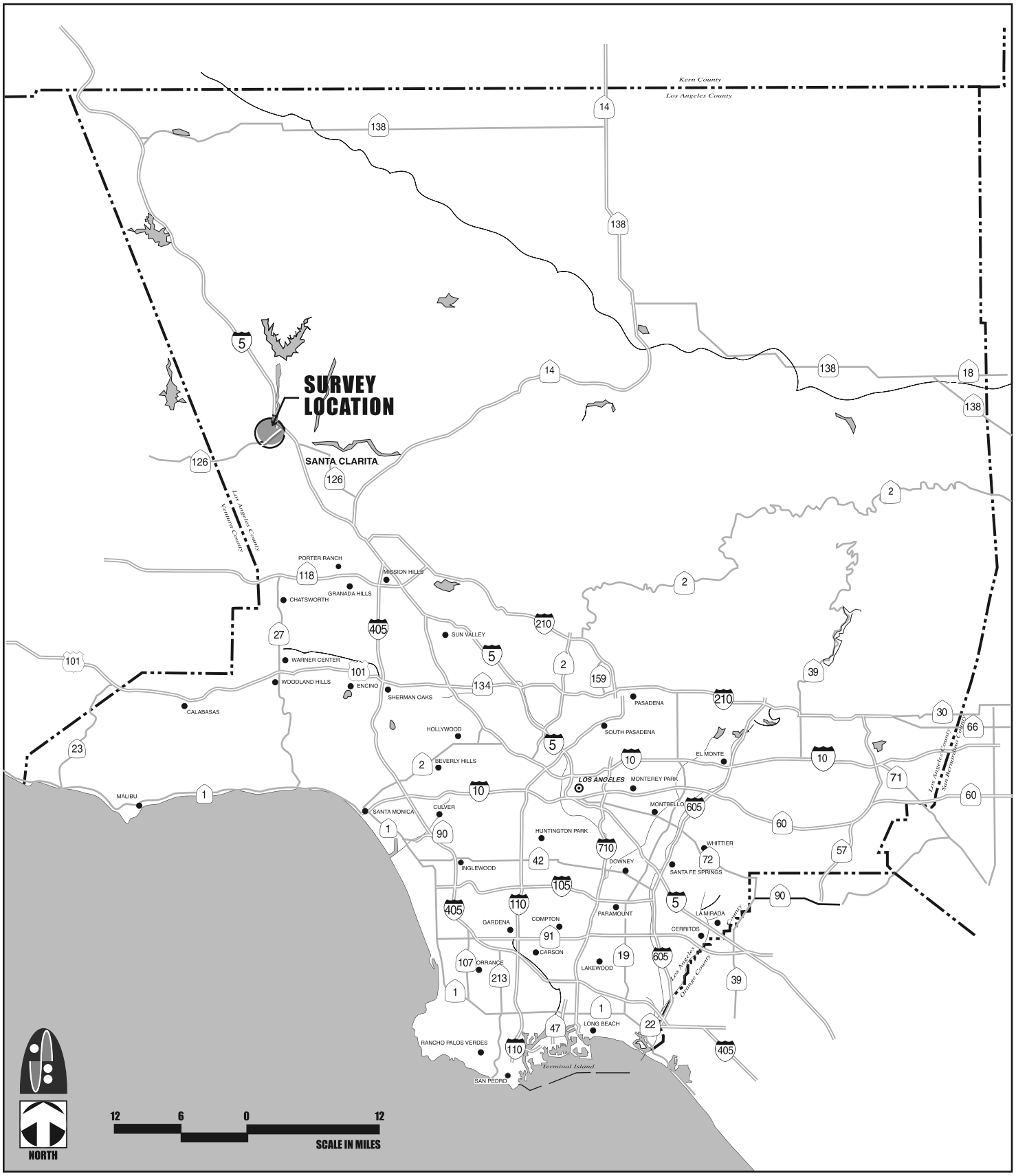
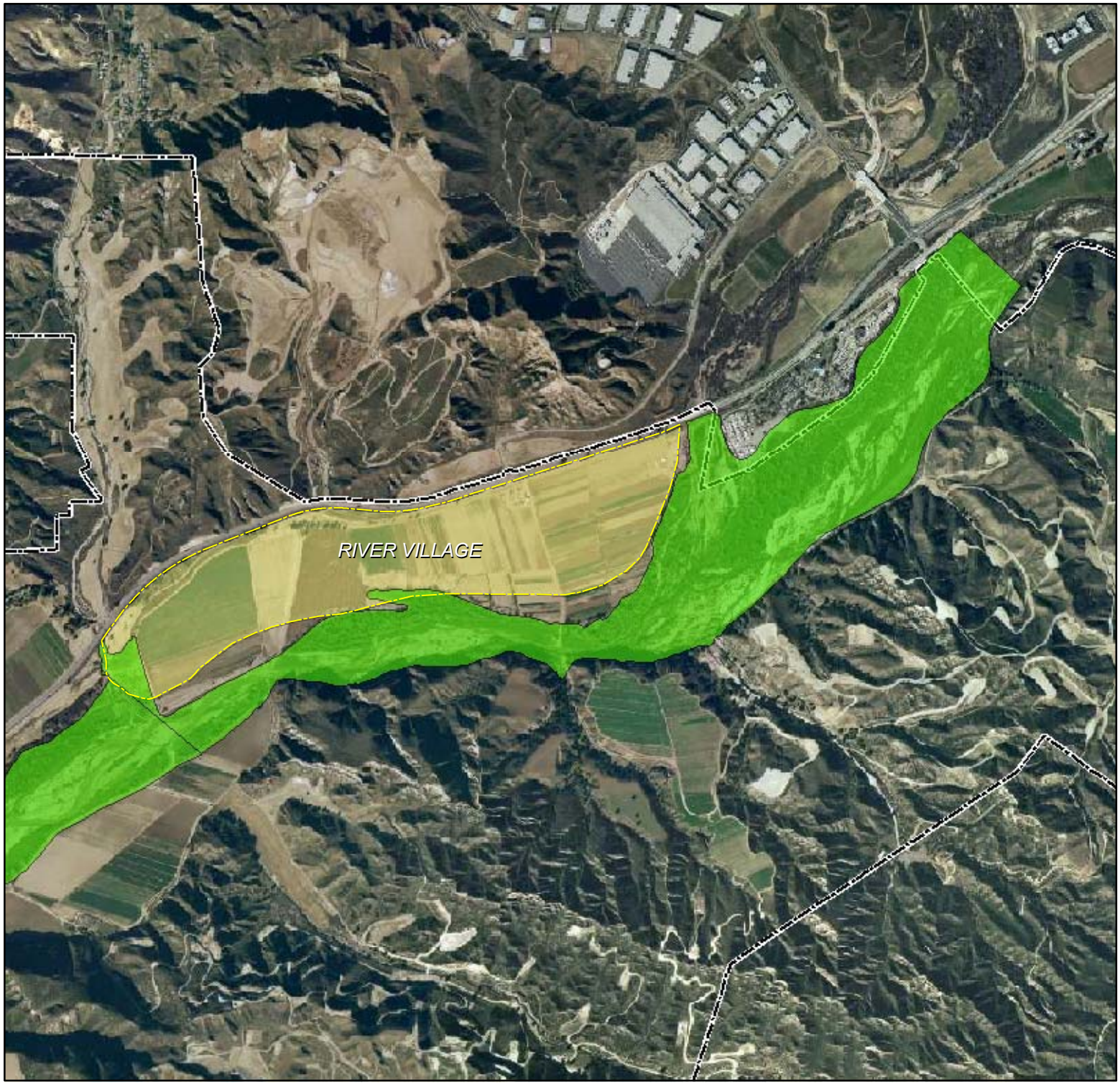


figure 1
Regional Location

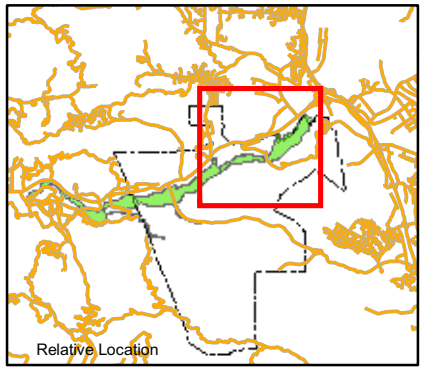


ARROYO TOAD REPORT

L E G E N D

Arroyo Toad Survey Reach

Newhall Ranch
Specific Plan Boundary



N

0 1,000 2,000 Feet

0 150 300 600 Meters

FORMA Systems

Figure 2
SURVEY REACH

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A federal Recovery Plan was prepared in 1999 and critical habitat was defined in February 2001. This critical habitat designation was rescinded by court order based on lack of economic impact considerations and has since been re-proposed in early 2004. The eastern portion of the survey reach lies within the newly proposed critical habitat area. Much of the information in the federal listing documents (FWS 1994, 1999, 2001) regarding the biology of the arroyo toad was derived from extensive research conducted by Dr. Samuel Sweet of the University of California, Santa Barbara (Sweet 1992, 1993). Additional detail is included in the Recovery Plan (FWS 1999) and a radio telemetry study conducted by Ruben Ramirez (2000).

Although considered a subspecies by some taxonomists, the nearest population of the arroyo toad's closest relatives is the Colorado River basin. Based on the separation from the other subspecies and results from recent genetic tests, it has been recommended that the arroyo toad be considered a separate species (FWS 2001). For this reason, many biologists refer to arroyo toad as *Bufo californicus* and it is therefore, considered as such in this report.

Arroyo toad historically ranged from the upper Salinas River, south through the Santa Ynez, Santa Clara, and Los Angeles River basins and the coastal drainages of Orange, Riverside, and San Diego Counties to the Arroyo San Simeon system into Baja California, Mexico (FWS 1999). As of 1994 arroyo toad was known from only 22 populations (Ramirez 2000). Many areas that may have historically contained suitable breeding habitat for arroyo toad have been degraded by dam and flood control construction, off-road recreation, urbanization, mining, and introduced predators (FWS, 1999). This species is currently found in relatively small, isolated populations. Most remaining populations of arroyo toad occur on privately owned lands. Less than 50 percent of the known extant populations of arroyo toad occur on the Los Padres, San Bernardino, and Cleveland National Forests (FWS, 1994).

Overview of Arroyo Toad Habitat Characteristics

In general, arroyo toad requires habitat features that occur in drainages of a narrow, intermediate range of size that have a sufficient number of tributaries to produce an amount of alluvium necessary to decrease the gradient and form suitable breeding pools (Sweet 1992). Dr. Sweet's research in the Los Padres National Forest also suggests that "The late breeding season and long periods of dependence on surface water of arroyo toad larvae and juveniles restrict them from occurring in areas where the riverbed dries out by early summer (1992)."

Habitats utilized by arroyo toad include both breeding sites and over-wintering sites. Suitable breeding habitat features include shallow pools with a minimum of vegetation along one or both margins during the breeding season (Sweet 1992). Preferred pools occur adjacent to sand bars and sandy, stream terraces with vegetation that is mature enough to stabilize the terrace soils during all but the largest storm events. Eggs are deposited and larvae develop in shallow pools with minimal current, little or no emergent vegetation, and a sand or pea gravel substrate overlain with silt (FWS, 1994). As described by Sweet (1992), the following characteristics are relatively consistent with documented breeding pools: proximity to sandy terrace habitat; minimal current; the majority of the pool is less than 30 cm deep; substrate is sand, gravel, or pebbles; a gently sloping shoreline, or central sand bar; and bordering vegetation is low or set back such that most of the pool is open to the sky.

After metamorphosis (usually in June and July), juvenile toads commonly remain on the bordering gravel bars until the natal pool dries up (often between 3 and 8 weeks) (Sweet 1992). Juvenile and adult toads feed on insects on sandy stream terraces with a sparse understory at ground level and a light to moderate overstory of riparian trees, including cottonwoods (*Populus* sp.), oaks (*Quercus* sp.), or willows (*Salix* sp.). Adult toads excavate shallow burrows on the terraces for shelter during the day when the surface is still damp or for longer intervals during the dry season (FWS, 1994).

Adult arroyo toads extensively utilize terraces and marginal zones (areas of mixed sediments that occur between the stream channel and mature riparian vegetation zone) outside the breeding season "and seem to have a critical dependence on terrace habitat in the late fall and winter months, when they are generally inactive" (Sweet 1992). Terraces utilized occur in the vicinity of breeding sites and are commonly characterized by sparse to moderate vegetation including mule fat (*Baccharis salicifolia*), California sycamore (*Platanus racemosa*), cottonwood, willow, and coast live oak (*Q. agrifolia*). The understory in these habitats may be bare or consist of scattered grasses herbs, and leaf litter (FWS 2001a). In order for any of these habitats to be suitable for arroyo toad use, several areas of open friable sand must be present where they can burrow (FWS 2001).

Adult arroyo toads have also been documented in upland habitats outside of a stream channel, primarily outside of the breeding season. These 'uplands' are generally associated with accessible upper flood terraces that occur in the vicinity of breeding habitat. Upland habitats utilized by over-wintering arroyo toad include alluvial scrub, coastal sage scrub, chaparral, grassland and oak woodland (FWS 2001). Soils are also important in these over-wintering habitats. Though individual arroyo toads have been documented from small mammal burrows, the majority of data suggests that they prefer sandy soils in which to burrow (Bloom, pers. com.). Data collected by Ramirez (2000)

suggest that arroyo toad may move burrow sites to follow soil moisture levels. Some arroyo toads have been documented to move back into the stream channel itself during the driest part of the season.

There is some variation in the timing of arroyo toad breeding based upon location and environmental conditions, but it generally takes place between February and late June. In the region that includes the subject survey area, breeding generally occurs between April and June. Adult males will select a breeding site generally based on the criteria described above, but may call from a variety of positions within the pools including the margins, edges of central bars, submerged bars, or occasionally from the surface of dense submerged vegetation (Sweet 1992). During courtship, males vocalize a high trill usually lasting 8 to 10 seconds (FWS 1999).

Critical Habitat Designation

Critical habitat is defined by the USFWS as: (1) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Endangered Species Act of 1973 as amended, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures that are necessary to bring an endangered or a threatened species to the point at which listing under the Act is no longer necessary (FWS, 2004).

Criteria used by FWS to select critical habitat includes evaluation of an area to determine the presence of 'primary constituent elements,' as defined in the Proposed Rule (FWS 2004). These elements include physical and biological features that are essential to the conservation of the species, and that may require special management and protection (FWS 2004). Primary constituent elements for the arroyo toad include aquatic breeding habitats and non-breeding upland habitats. These elements are generally outlined by Sweet (1992, 1993) and were expanded and are specifically defined in the Proposed Rule including:

- Space for Individual and Population Growth and for Normal Behavior. "Essential habitat for the arroyo toad is created and maintained by the fluctuating hydrogeological, geological, and ecological processes operating in riparian ecosystems and the adjacent uplands. Periodic flooding that modifies stream channels, redistributes channel sediments, and alters pool location and form, coupled with upper terrace stabilization by vegetation, is required to keep a stream segment suitable for all life stages of the arroyo toad." "Eggs and tadpoles require aquatic habitat…"

"Riparian habitats used by subadults and adults for foraging and burrowing include sand bars, alluvial terraces, and streamside benches that lack vegetation, or are sparsely to moderately vegetated. Upland habitats used by arroyo toads during both the breeding and nonbreeding seasons include alluvial scrub, coastal sage scrub, chaparral…, grassland, and oak woodland. Arroyo toads have also been found in agricultural fields, but these lands may constitute sinks (areas where mortality rates are higher than reproduction rates) over the long term due to tilling, pesticide and fertilizer applications, and heavy equipment use." "The substrate in habitats preferred by arroyo toads consists primarily of sand, fine gravel, or pliable soils, with varying amounts of large gravel, cobble, and boulders. Areas that are damp and have less than 10 percent vegetation cover provide the best conditions for juvenile survival and rapid growth. Arroyo toads must be able to move between the stream and upland foraging sites, as well as up and down the stream corridor." (FWS 2004)

- Food, Water, and Physiological Requirements. Arroyo toad tadpoles eat microscopic algae, bacteria, and protozoans sucked up from the spaces among pebbles, gravel, and sand or abraded from stones. Juveniles and adults feed on insects, but specialize on ants. When foraging, arroyo toads are often found around the driplines of oak trees. These areas often lack vegetation, yet have sufficient levels of prey. When active at night, toads often can be observed near ant trails feeding on ants, beetles, and other prey." (FWS 2004)

- Cover or Shelter. During the day and other periods of inactivity, arroyo toads seek shelter by burrowing into the sand. Thus, areas of sandy or friable (readily crumbled) soils are necessary to burrow, but these soils can be interspersed with gravel or cobble deposits. Arroyo toads may also seek temporary shelter under rocks or debris and have been found in mammal burrows on occasion. Upland sites with extremely compact soils can also be used for foraging and dispersal." (FWS 2004)

- Sites for Breeding, Reproduction and Rearing of Offspring. Arroyo toads "favor shallow pools and open sand and gravel channels along low-gradient (Typically less than 6 percent) reaches of medium-to-large-sized streams. These streams can have either intermittent or perennial streamflow and typically experience periodic flooding that scours vegetation and replenishes fine sediments." "Breeding pools must persist long enough for the completion of larval development (at least in most years), which is generally March through June, depending on location and weather." "Peak metomorphosis occurs during June and July in the northern part of the toad's range, and from late April through June further south, although it may be later, particularly at higher elevations." (FWS 2004)

- Disturbance, Protection, and the Historical Geographical Distributions. Pursuant to federal regulations the FWS is required to identify the known physical and biological features (PCEs) essential to the conservation of the arroyo toad, together with a description of any critical habitat that is proposed. "The PCEs determined essential to the conservation of arroyo toad include, but are not limited to:

1. Rivers or streams with hydrologic regimes that supply water to provide space, food, and cover needed to sustain eggs, tadpoles, metamorphosing juveniles, and adult breeding toads. Specifically, the conditions necessary to allow for successful reproduction of arroyo toads are:
   a. breeding pools with areas less than 12 in (30cm) deep;
   b. areas of flowing water with current velocities less than 1.3 ft per second; and
   c. surface water that lasts for a minimum length of 2 months in most years, *i.e.*, a sufficient wet period in the spring months to allow arroyo toad larveae to hatch, mature, and metamorphose.
2. Low–gradient stream segments (typically less than 6 percent) with sandy or fine gravel substrates that support the formation of shallow pools and sparsely vegetated sand and gravel bars for breeding and rearing of tadpoles and juveniles.
3. A natural flooding regime, or one sufficiently corresponding to a natural regime, that will periodically scour riparian vegetation, rework stream channels and terraces, and redistribute sands and sediments, such that breeding pools and terrace habitats with scattered vegetation are maintained.
4. Riparian and adjacent upland habitats (particularly alluvial streamside terraces and adjacent valley bottomlands that include areas of loose soil where toads can burrow underground) to provide foraging and living areas for subadult and adult arroyo toads.
5. Stream channels and adjacent upland habitats that allow for migration to foraging areas, overwintering sites, dispersal between populations, and recolonization of areas that contain suitable habitat."

It should be noted, and is discussed in the Proposed Rule that arroyo toads are not distributed uniformly throughout the designated critical habitat areas and that breeding and upland habitats are patchily distributed (FWS 2004). The nature of breeding habitats is dynamic and may shift in structure and location from year to year depending upon seasonal rainfall and storm cycles. Similarly upland habitats, though more stable, can be affected by fire, storms, and other natural events.

In order to preserve as much of the ecological and geographic diversity of arroyo toad distribution, three recovery units were selected. These are referred to as the Northern, Southern, and Desert recovery units. These units are based on ecological and geographic separation and the known and historic range of the species. The FWS' goal is to stabilize and expand the populations in these units in order to preserve the species' genetic diversity as well as the environments in which the species is found (FWS 1999). The recovery units are based on the U.S. Geological Survey hydrologic subregion and accounting unit boundaries as delineated on the Hydrologic Unit Map. The objective of the recovery plan is to initially recover the arroyo toad sufficiently to warrant reclassification to Threatened status and finally to recover the species sufficiently to warrant delisting altogether (FWS 2001).

The FWS has identified 23 critical habitat units for the recovery of the arroyo toad. The unit nearest to Newhall Ranch is Unit 6, the Upper Santa Clara River Basin, which consists of portions of Castaic and San Francisquito Creeks, the Santa Clara River, and adjacent uplands, encompassing approximately 7,398 acres. Arroyo toads have been recorded at the following locations within critical habitat Unit 6, upstream of the subject Newhall Ranch survey area.

- Upper Castaic Creek (SubUnit 6a) –above the reservoir – occurrences documented the U.S. Forest Service above the Castaic Lake reservoir (FWS 2004)

- Santa Clara River (SubUnit 6b) – 2003 communication to FWS by Ruben Ramirez of Cadre Environmental reported "…recent observations of arroyo toads and eggs" in the Santa Clara River in the vicinity of the San Francisquito Creek confluence (FWS 2004).

- Santa Clara River – 2001, protocol surveys by Impact Sciences found a single adult arroyo toad near the confluence of San Francisquito Creek.

- Santa Clara River – 2001, Ms. Nancy Sandburg reports observance of 4 adult arroyo toads near the confluence of San Francisquito Creek to FWS.

- Upper San Francisquito Creek – Calling male arroyo toads heard in 1997 near the old St. Francis Dam (FWS 2004).

The FWS (2004) considers the Santa Clara River to be essential as a dispersal corridor for arroyo toads between Castaic Creek and upper San Francisquito Creek. FWS (2001a) believes the stability of the Upper Santa Clara River basin arroyo toad population will increase substantially with appropriate management of non-native plants and animals and habitat rehabilitation. These activities are already underway in the lower San Francisquito Creek area and include removal of giant cane and tamarisk from the streambed and supplemental plantings of willows and cottonwoods. Approximately two miles of the eastern portion of the River Village survey reach occurs within the proposed Critical Habitat Unit 6.

METHODOLOGY

Previous Studies In and Near the Newhall Ranch Project Area

Documentation pertinent to the biological resources in the vicinity of the site was reviewed and analyzed. Information reviewed included: (1) the Federal Register listing package for the federally listed Endangered arroyo toad potentially occurring on the project site; (2) literature pertaining to habitat requirements of sensitive species potentially occurring on the project site; (3) the California Natural Diversity Data Base (CNDDB 2004) information regarding special-status species potentially occurring on the project site for the Newhall, Val Verde, and Mint Canyon USGS 7.5-minute quadrangle maps, and (4) previous surveys for aquatic resources in the Newhall Ranch project area. A summary of the results are provided below.

- Federal Register – The December 16, 1994 Determination of Endangered Status for the Arroyo Southwestern Toad (50 CFG Part 17, RIN 1018-AB97) cited arroyo toad locations from Sespe and Piru Creeks and the Los Padres National Forest (FWS 1994). There were no records of any arroyo toad in the Newhall Ranch area mentioned in this report.

- The April 2004 Proposed Critical Habitat for the Arroyo Toad stated that arroyo toads have been reported from Castaic Creek above the reservoir, from San Francisquito Creek between the southern end of Section 34 and Bee Canyon, and in the Santa Clara river in the vicinity of the San Francisquito Creek confluence. There were no records of any arroyo toad in the Newhall Ranch area mentioned in this report (FWS 2004).

- Rare Plant and Animal Survey, Santa Clarita Water District Service Area (San Marino Environmental Associates, 1995) – Non-protocol reconnaissance surveys were conducted in the NMRP area, but the species was not observed. However, the author states that it could be present in low numbers.

- Sensitive Aquatic Species Survey for Newhall Land & Farming Company (San Marino Environmental Associates, 1995) – Non-protocol reconnaissance surveys were conducted of the Santa Clara River from Bouquet Canyon to Castaic Creek, and along San Francisquito. None were found.

- Newhall Ranch Biota Report (RECON, 1995) – Non-protocol surveys were conducted on the Santa Clara River for the Newhall Ranch Specific Plan EIR prepared by Los Angeles County. None was

observed during the surveys, but the report states there is a moderate potential for their occurrence on the main stem in Newhall Ranch.

- Survey for Arroyo Toad for Newhall Ranch (RECON, 1999) – Protocol surveys were conducted, but no toads were observed. However, appropriate habitat is present.

- Biota Report for SEATAC for West and East Creek Projects on San Francisquito Creek (Impact Sciences, 1998) – Report states that the species may travel periodically to project area from upstream population; cited Frank Hovore's report of anuran (frog or toad) eggs observed in the project area, but washed away by stream flows before an accurate identification could be made.

- Surveys on Tesoro del Valle (White and Leatherman Bioservices, 2001) – Arroyo toad habitat assessment for the Tesoro del Valle project located on San Francisquito Creek, immediately north of the NRMP project area. The assessment focused on the Tesoro project area, as well as approximately 9 linear miles of San Francisquito Creek habitat, north from its confluence with the Santa Clara River. The evaluation was based on the presence or absence of primary constituent habitat elements. The report concluded that the most critical primary constituent element is a hydrologic regime that supports habitat for breeding adults, eggs, tadpoles, and metamorphosing juveniles (Leatherman, 2000). As such, it was determined that the best potential habitat for the arroyo toad in San Francisquito Creek occurs north of the Tesoro del Valle project site on the National Forest. The report further stated that though the project area and other portions of San Francisquito Creek south of U.S. Forest Service lands supported many of the primary constituent elements, the hydrologic regime was not present. Therefore, it was concluded that this portion of San Francisquito Creek would only be useful for dispersing individuals if they were to occur in the immediate area.

- Sandburg Reconnaissance Surveys, NRMP project area – In April 2001, Ms. Nancy Sandburg conducted surveys in the Santa Clara River on Newhall Land and Farming property. In notes sent to the FWS, Ms. Sandburg reported observations of a total of four adult toads from several survey efforts. Each was detected in the Santa Clara River in the near vicinity of the San Francisquito Creek confluence. Ms. Sandburg's notes did not include detection of any vocalizations or any other breeding behavior.

- Sandburg Reconnaissance Surveys, Soledad Canyon area – In May 2001, Ms. Sandburg conducted arroyo toad surveys in the Santa Clara River in the Soledad Canyon area. Arroyo toad tadpoles

(three separate cohorts) were reported from three separate drying pools within the project reach which includes the portion of the Santa Clara River occurring between the River's End vacation park and the proposed Transit Mix Concrete Company mine. This site is situated approximately 9 miles east of the NRMP. Ms. Sandburg noted that there was a potential for some of the tadpoles to be lost before metamorphosis due to the rapid evaporation of the remaining water in the pools (Sandburg 2001).

- Impact Sciences, Inc. protocol surveys in NRMP area, portions of Castaic Creek, San Francisquito Creek from the Santa Clara River to the Copper Hill Bridge, and the Santa Clara River east from the NRMP area to approximately 500 meters past the Los Angeles Aqueduct crossing, including portions of South Fork Santa Clara River and Bouquet Creek – In spring 2001 intensive surveys following FWS recommended survey protocol were conducted in the described area. A single arroyo toad was observed in the Santa Clara River adjacent to the San Francisquito Creek confluence.

- Results of Focused Surveys for Arroyo Toad and Special-status Aquatic Reptiles and Amphibians; Newhall Ranch (Impact Sciences, Inc. 2002). Protocol surveys were conducted during the 2001 survey season in the Santa Clara River from near the confluence with Castaic Creek, west (downstream) to the Los Angeles-Ventura County boundary. No arroyo toads were observed or detected.

Survey Scope and Methods

FWS developed a survey protocol to determine the presence or absence of arroyo toad (FWS 2001; see **Appendix A**). The protocol requires six focused surveys be conducted in suitable habitat between March 15 and July 1 with at least seven days between surveys. The surveys were timed such that at least one survey is conducted during the months of April, May, and June. Protocol surveys include both daytime and nighttime components conducted within the same 24-hour period. Surveys are not to be conducted during adverse weather conditions because environmental conditions such as low temperatures, high winds, and rain may affect the behavior of arroyo toad. Full moon phases are also avoided.

Compliance Biology, Inc. conducted protocol surveys for arroyo toad beginning March 19, 2004 within the River Village project reach. David Crawford, principal biologist, conducted all surveys and was accompanied by Tim Rademaker, a current Environmental Science student at CSUCI. Mr. Crawford is a FWS authorized surveyor for arroyo toad and permission was granted from the FWS Ventura field office to conduct these specific surveys and utilize Mr. Rademaker as an assistant.

The primary purpose of the survey effort was to determine presence/absence of arroyo toad within the project area. As such, pursuant to protocol, if and when any arroyo toads were observed or detected, surveys would cease in those specific areas. Surveys would be continued in areas adjacent to observed toads in order to accurately map the specific locations of all occupied areas within the entire survey reach.

Pursuant to protocol methodologies, a series of six day and night surveys (conducted within the same 24-hour period) were conducted at least seven days apart. Additionally, at least one survey was conducted in April, May, and June as directed in the protocol guidelines. Survey dates for the River Village survey reach were March 19, April 23, May 7, May 21, June 11, and June 25, 2004. The entire survey reach was systematically surveyed by at least two authorized surveyors at a time. Daytime surveys consisted of searching for suitable breeding pools to determine if egg masses, tadpoles, or metamorphosing juveniles were present, and for the purpose of identifying the most likely calling sites for any adult males that were potentially in the area. All nighttime surveys were conducted when air temperatures were at least 55 degrees Fahrenheit when they were initiated. Periods of full moon phases were generally avoided. Surveys were conducted each night from about 2030 to 2330 hours.

Weather conditions were generally calm and clear throughout the survey effort with a few nights of relatively overcast conditions. The project area was surveyed by walking slowly and carefully along stream banks or within the stream itself when necessary. As with the daytime surveys, every precaution was taken not to disturb or create silt deposits within potential breeding pools, and care was taken not to disturb or injure potentially occurring arroyo toad adults, juveniles, tadpoles, or egg masses. Periodic stops were taken to listen for calling males at 15-minute intervals or as appropriate depending upon individual zone conditions. Surveys were conducted as quietly as possible to maximize the potential to hear calling arroyo toads. Handheld flashlights and headlamps were utilized to visually locate toads within potential breeding areas and along stream banks. In addition to documenting arroyo toad data, all aquatic herpetofauna observed during both day and night surveys were recorded.

Three additional visits were made to an area known to be occupied by arroyo toad to determine if and when adult males were calling and what stages of development larval tadpoles would be in. The area surveyed was a portion of Castaic Creek that is situated approximately one mile north of the Castaic reservoir on U.S. Forest Service land, near the eastern terminus of Templin Highway.

PROTOCOL SURVEY RESULTS

No arroyo toads were observed or detected in or adjacent to the River Village survey area. Daytime surveys did not reveal the presence of any egg masses or larvae and no juvenile or adult toads were observed or otherwise detected during any of the survey efforts. In addition, no available survey data indicates that the arroyo toad has been recently recorded within or adjacent to the River Village project site.

Though no arroyo toads were recorded, other amphibian and aquatic reptile species were detected. All life stages of western toad (*Bufo boreas*), Pacific chorus frog (*Hyla regilla*), and California chorus frog (*Hyla cadaverina*), were recorded. Western toads and Pacific chorus frogs were very common while California chorus frogs were only detected during two of the surveys. An interesting note is that no bullfrogs (*Rana catesbeiana*) were detected during the entire survey effort. However, numerous tadpoles, juvenile and adult forms of the invasive African clawed frog (*Xenopus laevis*) were observed at various points within the survey reach during all but two of the surveys. Several southwestern pond turtles (*Clemmys marmorata pallida*), a California protected species and state species of special concern, were also observed in ponded areas of the river during many of the daytime surveys. Specific locations of pond turtles observed are illustrated on **Figure 3**. Curiously, no two-stripe garter snakes (*Thamnophis hammondii*) were detected during the survey effort despite their relatively common occurrence during the 2001 surveys conducted by Impact Sciences in this same area. There were no obvious changes to existing conditions in or adjacent to the river that would explain their lack of occurrence.

Most of the habitat covered by protocol surveys within the River Village reach was considered to be of relatively high quality as most or all of the primary constituent elements of arroyo toad habitat were present. Habitats in the survey reach included some densely wooded areas, as well as sparsely vegetated sandbars with gravelly to sandy substrates. Within the more open areas, scattered willow saplings were present as were, small clumps giant cane and non-native tamarisk (*Tamarix* sp.). In some areas, the outer terraces existing along the base of the north and south banks, supported patches of larger cottonwoods and willows, and other areas were more dominated by mule fat. Upland areas on the north side of much of the survey reach adjacent to the proposed River Village site lacked much vegetation as it is under active agriculture. The vegetation along the margins of the stream channel was sometimes characterized by very dense and included willows, cottonwoods, and dense patches of cattails. Other areas supported little vegetation other than sparsely scattered mule fat or tamarisk.

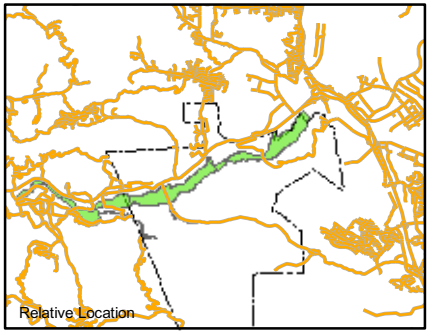
ARROYO TOAD REPORT

L E G E N D

Southwestern Pond Turtle.

Arroyo Toad Survey Reach

Newhall Ranch
Specific Plan Boundary



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0 1,000 2,000 Feet

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10-19-04

Figure

SPECIAL-STATUS SPECIES LOCATION

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As previously mentioned, three individual evening/nighttime site visits were made at a known occupied site north of Castaic Lake for the purpose of determining active calling periods, laying periods, and timing of metamorphosis. Site visits were conducted on April 7, April 20, and June 8. On April 7, several calling males were heard and three individual males were observed at the concrete crossing at the terminus of Templin Highway. None was heard or observed during the second visit though winds were relatively high and nighttime temperatures were cooler than usual for that month. During the third visit, there were also no indications of arroyo toad as the creek had stopped flowing and had dried with the exception of a few small pools. However, conversations with Mr. Chris Delith of FWS indicated that further downstream of the areas we visited, there were more pools and numerous arroyo toad tadpoles were observed during the same period of time we were in the area. Mr. Scott Cameron, who was concurrently surveying portions of the Santa Clara River east of the subject survey zones, conducted additional visits to the occupied sites north of Castaic Dam. This information, and the information received from Mr. Delith was useful in calculating if and when adults would be calling and when tadpoles would likely begin metamorphosing in the survey area if they were to be present.

DISCUSSION/CONCLUSIONS

Based on the results of the studies conducted by Compliance Biology, Inc. and from other surveys conducted in the vicinity over the past several years, it is appears that arroyo toads are absent in this portion of the Santa Clara River watershed. Though speculative, there are a number of possible explanations for their apparent absence. As most of the major arroyo toad studies have described in detail, there are a number of factors that contribute to the reduction of arroyo toad populations, and nearly all of these factors are present within the subject survey area.

Habitat destruction and alteration has been described by most experts as being the primary cause for the decline in arroyo toad numbers. Sweet (1992) identifies dams as being responsible for greatest amount of suitable arroyo toad habitat and cites a number of examples. The portion of river within the River Village project area is affected both directly and indirectly by dams and other sources of flow regulation. Castaic Dam occurs between two contemporary documented populations of arroyo toad (FWS 2001a), which suggests it may have eliminated a considerable amount of suitable habitat for this species, in particular those areas located downstream of the dam.

Water flows along the Santa Clara River in the River Village area during the survey period are largely attributable to the tertiary treated effluent releases from the WRP No. 32 and further

upstream (adjacent to Bouquet Canyon Road Bridge) from WRP No. 26. Fluctuating flow rates and water levels from WRP releases may also be a factor in affecting suitable breeding habitat in the river.

Non-native predators can also be a contributing factor to the reduction of arroyo toad in the region. This year numerous African clawed frog tadpoles, juveniles and adults were observed in pools adjacent to flowing channels. This predatory species appears to be increasing in number in the Santa Clara River watershed. African clawed frogs have been observed preying on various life stages of arroyo toad including eggs, larvae, and adults (Ramirez 2000). Non-native fishes feeding on larval and juvenile arroyo toad have also been recorded (Sweet 1992). Several predatory species of non-native fish are known from the Santa Clara River system. Though none was directly observed during the survey effort, it is likely they still occur and pose a threat to breeding toads.

Native predators also contribute to reduce numbers of arroyo toad in a given area. Two-striped garter snake and southwestern pond turtle are both known from the Santa Clara River within the River Village vicinity. Though declining in numbers themselves, when either of these two species encounters a breeding pool of arroyo toad tadpoles, they can significantly impact that population. Wading birds such as herons and egrets also have a potential to significantly impact tadpole populations.

Other land uses such as urbanization, agriculture, and mining can also contribute to the reduction of suitable habitat. Development reduces the amount of area available to locally occurring arroyo toads and factors such as increased human presence and non-native plants and animals, and alteration of water quality inevitably follow. Agriculture commonly includes regular tilling of soil and introduction of pesticides and herbicides, all contributing to the reduction of the amount of suitable habitat available to this species. Sand and gravel mining operations also directly impact river and streambeds and result in increased silt loads that can smother egg masses downstream.

A previous habitat evaluation revealed that the majority of suitable arroyo toad habitat present within the Newhall Ranch area occurs between the banks of the Santa Clara River (Impact Sciences 2002). Beyond the outer banks, both natural topography and human activities provide an inaccessible and/or inhospitable environment for any dispersing toads. It was also noted that much of the upland habitat beyond the banks of the stream may not have historically provided suitable over-wintering habitat for adult arroyo toad due to the arid conditions and lack of constituent elements that characterize high quality arroyo toad habitat. As such, it is possible that arroyo toad numbers were never high (if historically present) in this portion of the Santa Clara River.

In summary, no arroyo toads were recorded within the portion of the Santa Clara River watershed included in the River Village project area, however this taxon has been recorded in very low numbers upstream (east) of the survey reach covered in this report. Whether one surmises that the upstream population(s) are a remnant of a once much larger population, or individuals from surviving upstream populations that may have been displaced during storm events from previous years, it is apparent that they are not breeding in the subject area and currently do not utilize habitats present within the River Village project survey area.

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APPENDIX A
Survey Protocol for the Arroyo Toad

compliance-biology

SURVEY PROTOCOL FOR THE ARROYO TOAD

May 19,1999

The following guidelines are provided to facilitate accurate assessments of the presence or absence of the federally listed endangered arroyo toad (Bufo microscaphus californicus). Accurate survey data are needed to provide the U.S. Fish and Wildlife Service (Service) with sufficient information to respond to requests for Federal permits and licenses. Currently, surveys performed in accordance with these guidelines will not require a permit under section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended. However, permits to conduct arroyo toad surveys may be required in the future. In all cases, extreme care must be taken when conducting surveys to avoid inadvertently injuring or killing toads, or damaging their habitat. These guidelines are not meant to be used for long-term monitoring of projects or the overall status of populations; guidelines for such monitoring efforts should be developed with the assistance of the Service for specific cases.

The Service recommends that the following survey guidelines be used to determine if arroyo toads are present in the vicinity of proposed activities, but cautions that negative surveys during a year of severe weather (e.g., drought, extended rainy season, cold weather) may be inconclusive. Contact the appropriate field office (addresses and phone numbers below) before conducting surveys for additional information.

1) Areas within one kilometer (1 km) of arroyo toad sites (documented by the presence of eggs, larvae, juveniles, or adults) that have suitable habitat shall be presumed to have arroyo toads.

2) If the sole purpose of surveys is to determine the presence or absence of the arroyo toad, surveys shall cease immediately upon determination that arroyo toad eggs, larvae, juveniles, or adults are present in the survey area. The arroyo toad locations shall be recorded on a USGS 1:24,000 (7.5 minute) map

3) To be reasonably confident that arroyo toads are not present at a site, at least six (6) surveys must be conducted during the breeding season, which generally occurs from March 15 through July 1, with at least seven (7) days between surveys. Extreme weather conditions can cause variations in the breeding season; these conditions should be fully considered when developing a schedule of surveys. If uncertainty exists as to whether environmental conditions are suitable (see guideline #9 below), contact the appropriate field office for further information.

4) At least one survey shall be conducted per month during April, May, and June.

5) Surveys shall include both daytime and nighttime components conducted within the same 24-hour period (except when arroyo toads have been detected in the survey area).

6) Daytime surveys shall include an assessment and mapping of: a) arroyo toad habitat suitability, and b) the presence of arroyo toad eggs, larvae, or juveniles. Extreme caution must be used to avoid crushing arroyo toads that are burrowed into sand bars and banks, or lodged in depressions in the substrate (sand, gravel, soil). Arroyo toads will use trails and roads up to

several hundred meters from breeding sites while foraging; therefore, caution must be taken to not disturb, injure, or kill arroyo toads when using these roads and trails.

7) Daytime surveys shall be conducted by walking slowly along stream margins and in adjacent riparian habitat, visually searching for (but not disturbing) eggs, larvae, and juveniles. If necessary, surveyors may walk within the stream, taking care not to disturb or create silt deposits within breeding pools. If stream crossings are necessary, these should be on the downstream ends of potential breeding pools or in fast-flowing channels to minimize the likelihood of stirring up silt deposits. Arroyo toad eggs are usually laid in shallow water (less than four inches deep), and are susceptible to being smothered by silt that may be raised by walking in or across breeding pools.

8) Nighttime surveys (assuming eggs, larvae, and/or juveniles have not been detected) shall be conducted by walking slowly and carefully on stream banks. Surveyors should stop periodically and remain still and silent for approximately 15 minutes at appropriate sites to wait for arroyo toads to begin calling. The same cautions used for daytime surveys to avoid disturbing, injuring, or killing arroyo toads shall be incorporated.

9) Nighttime surveys must be conducted between one hour after dusk and midnight, when air temperature at dusk is 55 degrees Fahrenheit or greater. Surveys should not be conducted during nights when a full or near-full moon is illuminating the survey area or during adverse weather conditions such as rain, high winds, or flood flows.

10) Nighttime surveys must be conducted as silently as possible, because talking or other human-generated noises may cause arroyo toads to stop calling or leave the creek. Strong headlights or flashlights may be used to visually locate and identify adult arroyo toads, and flash photography may be used to document sightings of solitary individuals; otherwise lighting should be kept to a minimum.

11) Pairs of arroyo toads are very sensitive to disturbances, particularly waves or ripples (calling males are less easily disturbed). Therefore, surveyors must not enter the water near amplexing or courting pairs, and must immediately leave the vicinity upon their discovery.

12) A final report, to be submitted within 30 days of each field season or positive survey shall be prepared that includes survey dates and times, names of surveyor(s), air temperature, estimated wind speed, lighting conditions, a description of the survey methods used, and survey locations plotted on a USGS 1:24,000 (7.5 minute) map.

13) The results of a field survey may not be valid for any of the following reasons: a) surveys were conducted in a manner inconsistent with this protocol, b) surveys were incomplete, c) surveys were conducted during adverse conditions or during a season of severe weather conditions, or d) reporting requirements were not fulfilled. In such cases, the Service may request that additional surveys be conducted.

The final report should be provided to the appropriate Service field office:

For surveys in Monterey, San Luis Obispo, Santa Barbara, and Ventura Counties, Los Angeles County west of Highway 405, and the desert portions of Los Angeles and San Bernardino Counties, reports should be sent to the Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, California 93003 (phone: (805) 644-1766).

For surveys in Los Angeles County east of Highway 405 and south of the desert, Orange, Riverside, Imperial, San Diego, and montane and cismontane San Bernardino Counties, reports should be sent to the Carlsbad Fish and Wildlife Office, 2730 Loker Avenue West, Carlsbad, California 92008 (phone: (760) 431-9440).

If a surveyor thinks that a specific project warrants alterations in this protocol, the Service should be contacted prior to the onset of surveys to discuss and possibly grant permission for proposed modifications. We would appreciate receiving any comments or ideas on these guidelines or recommendations for their improvement. For additional information, please contact the Ventura Fish and Wildlife Office at (805) 644-1766 or the Carlsbad Fish and Wildlife Office at (760) 431-9440.

Diane K. Noda

Diane K. Noda
Field Supervisor

Ecosciences, Arroyo Toad Letter Report

ECOLOGICAL SCIENCES

2529 Ironstone Street ♦ Oxnard, California 93030 ♦ Tel 805.278.7718 ♦ Fax 805.485.6788

August 2, 2001

Mr. Rick Farris
U.S. Fish and Wildlife Service
2493 Portola Road, Ste. B
Ventura, CA 93003

Subject: Permit Submittal Requirement, TE-808242, Arroyo Toad Surveys, Los Angeles County, California

Dear Rick:

This letter report summarizes the methodology and findings of surveys conducted for the federally-listed endangered (*Bufo microscaphus californicus-henein AT*) conducted by Ecological Sciences, Inc. under contract with Impact Sciences, Inc. The surveys were conducted to determine the presence and distribution of the AT within the subject study area.

Survey Location

The survey areas included portions of the Santa Clara River, Castaic Creek, San Francisquito Creek, Santa Clara River south fork, and Bouquet Creek, west to the County of Ventura border. A survey area location map (Plate 1) is attached to provide the U.S. Fish and Wildlife Service (Service) with more specific AT survey locality information. For the purposes of this study, the survey area was generally divided into seven separate zones as follows: **Zone 1**-Interstate 5 downstream to the confluence with Castaic Creek; **Zone 2**-Castaic Creek from the Interstate 5 bridge downstream to the confluence with the Santa Clara River; **Zone 3**-confluence of Castaic Creek and Santa Clara River to Chiquito Canyon; **Zone 4**-Chiquito Canyon to Ventura County border; **Zone 5**-Interstate 5 upstream to McBean Parkway, inclusive of San Francisquito Creek upstream to Newhall Ranch Road; **Zone 6**-McBean Parkway upstream to Bouquet Canyon Road, inclusive of South Fork to Magic Mountain Parkway and Bouquet Creek upstream to Newhall Ranch Road; and **Zone 7**-Castaic Afterbay area (downstream of lagoon) inclusive of a separate upland area located near the Interstate 15/ Highway 26 intersection.

Methodology

Guidelines for the AT do not presently require a permit under section 10 (a) (1) (A) of the Endangered Species Act of 1973, as amended. However, during the course of surveys conducted for AT, identification, and therefore direct examination, of AT juveniles and tadpoles may be necessary during spring/summer surveys of aquatic habitats. Accordingly, all field surveys for AT were conducted according to the most recent U.S. Fish and Wildlife Service (Service) guidelines under the authority of federal section 10(a) permit number TE-808242-4 issued to Scott Cameron. Only those surveyors with experience with AT biology were utilized during the survey effort, which also included David Crawford, Pete Bloom (separately permitted), and Chris Nemola. Two surveyors were present during each survey.

At least six (6) surveys were conducted along each zone, with at least seven (7) days between each survey. Additionally, AT surveys were conducted both during daylight hours and at night between one hour after dusk and midnight. Each day and nighttime *AT* survey was conducted within the same 24-hour period. Surveys were conducted between mid-April and late June. Daytime surveys included an

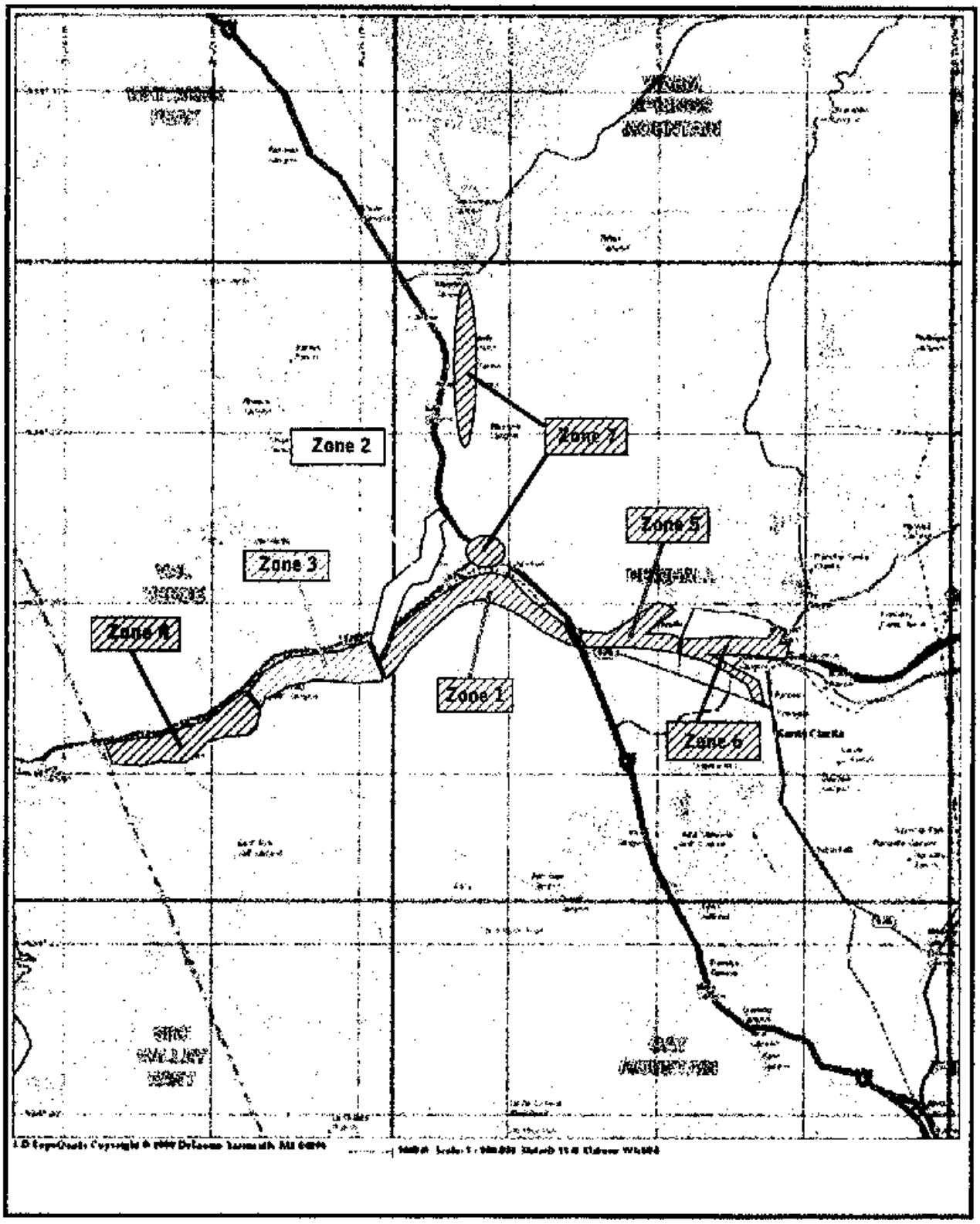

plate **1**

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August 2001

Schematic of Focused Survey Locations

assessment of arroyo toad habitat suitability as well as searches for sign of AT presence (e.g., eggs, larvae, or juveniles). Extreme caution was taken to avoid inadvertent disturbances to AT potentially presence within adjacent stream areas.

All nighttime surveys were conducted when air temperatures were at least 55 degrees Fahrenheit. Periods of full moon phases were generally avoided. Surveys were conducted each night from about 8:30 p.m. to approximately 12:00 a.m. Weather conditions were generally calm and clear throughout the survey effort with just a few days of relatively overcast conditions. Each zone was surveyed by walking slowly and carefully along stream banks or within the stream itself when necessary. As with the daytime surveys, every precaution was taken not to disturb or create silt deposits within potential breeding pools, and care was taken not to disturb or injure potentially occurring AT adults, juveniles, tadpoles, or egg masses. Periodic stops were taken to listen for calling AT at 15-minute intervals or as appropriate depending upon individual zone conditions. Surveys were conducted as quietly as possible to maximize the potential to hear calling AT. Handheld flashlights and headlamps were used to visually locate AT within potential breeding pools and along stream banks.

Surveys were initiated on April 17 and completed on June 26, 2001 as follows: April 17 (Zone 1), April 19 (Zone 3 and 4), April 22 (Zone 2), April 29 (Zone 7), April 26 (Zone 5), April 28 (Zone 6); May 1 (Zone 3), May 2 (Zone 4), May 3 (Zone 2 plus upper San Francisquito Creek), May 4 (Zone 5), May 8 (Zone 6), May 12 (Zone 7), May 14 (Zone 4), May 15 (Zone 1), May 18 (Zone 2 plus upper San Francisquito Creek), May 21 (Zone 3), May 24 (Zone 5), May 25 (Zone 6), May 26 (Zone 7), May 27 (Zone 1), May 28 (Zone 2), May 29 (Zone 4), May 31 (Zone 5); June 2 (Zone 7), June 7 (Zone 3), June 8 (Zone 5), June 9 (Zone 6), June 10 (Zone 7), June 11 (Zone 1), June 12 (Zone 2), June 13 (Zone 4), June 14 (Zone 3), June 15 (Zone 5), June 16 (Zone 6), June 17 (Zone 7), June 18 (Zone 1), June 19 (Zone 2), June 20 (Zone 4), June 21 (Zone 3), June 23 (Zone 6), June 26 (Zone 1).

Results

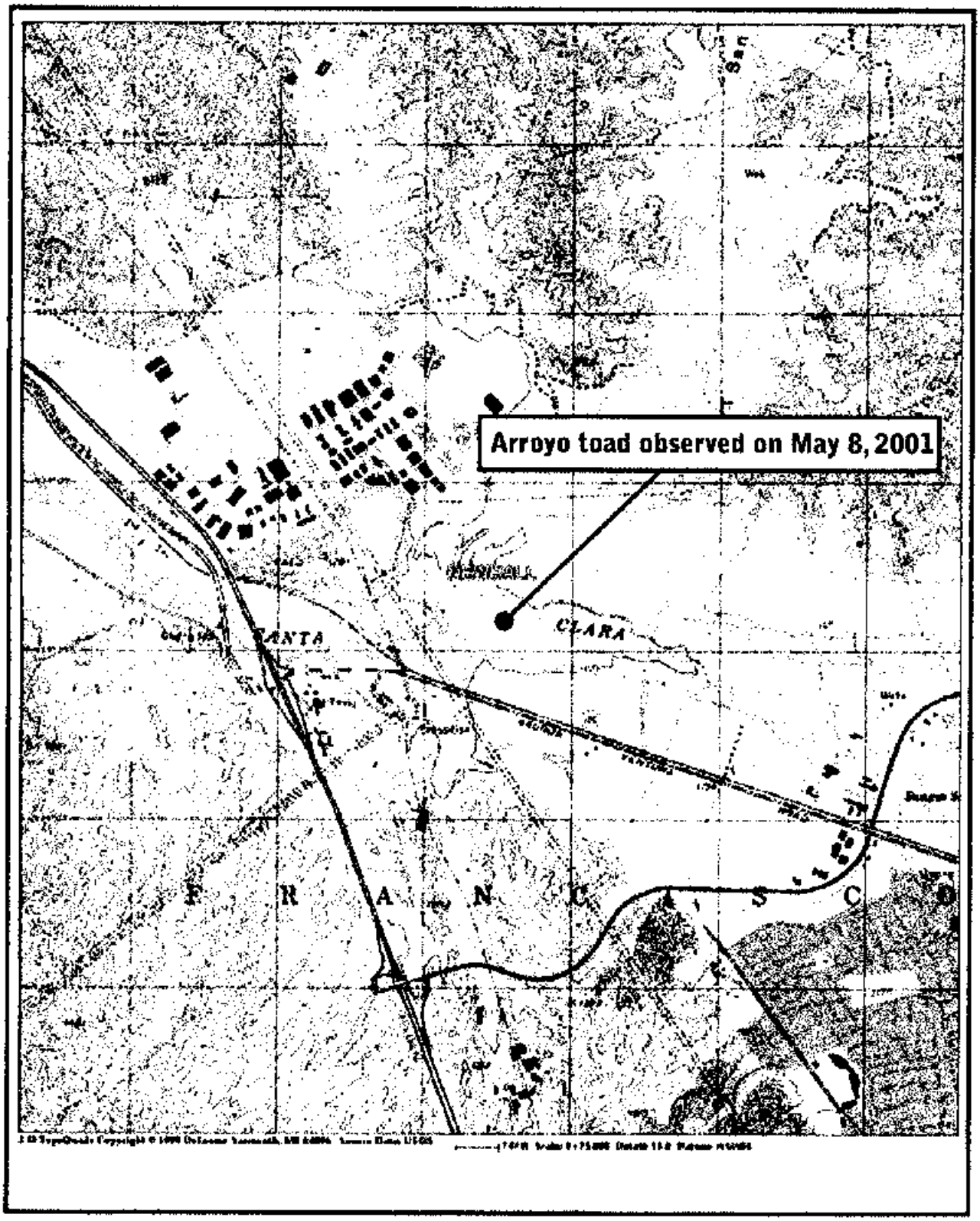
One adult male AT was observed during the survey effort on May 8, 2001. The toad was recorded by direct observation and was not heard vocalizing. The observation time was 10:31pm near the confluence of San Francisquito and downstream of the McBean bridge. Plate 2 illustrates the AT location point taken with a handheld GPS unit at the time of the observation. No other AT were recorded during the focused survey effort. Other amphibian species recorded during the focused AT survey effort included adults, juveniles, and tadpoles of the western toad (*Bufo boreas*), Pacific chorus frog (*Pseudacris regilla*), California chorus frog (*Pseudacris cadaverina*), and African clawed frog (*Xenopus laevis*). Aquatic reptile species recorded included the two-striped garter snake (*Thamnophis hammondii*) and western pond turtle (*Clemmys marmorata pallida*).

If you have any questions regarding results presented in this report, please don't hesitate to call.

Sincerely,

Ecological Sciences, Inc.

Scott D. Cameron
Principal Biologist



ECOLOGICAL SCIENCES
August 2001

plate **2**

Arroyo Toad Location

RECON, Survey for Arroyo Southwestern Toad

SURVEY FOR ARROYO SOUTHWESTERN TOAD
FOR
NEWHALL RANCH

Prepared for

NEWHALL RANCH COMPANY
23823 VALENCIA BOULEVARD
VALENCIA, CA 91355

Prepared by

GERALD A. SCHEID
SENIOR BIOLOGIST

RECON NUMBER 2599F
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Introduction

Arroyo southwestern toad surveys were conducted within the Santa Clara River and Castiac Creek on the Newhall Ranch property in the spring of 1999. The Newhall Ranch property is located in the northwestern portion of Los Angeles County west of the city of Santa Clarita and south of Highway 126 (Figures 1 and 2). Major water courses on the property include a portion of the Santa Clara River and Castaic Creek. These two waterways were the focus of the arroyo toad surveys because they contain suitable habitat for the subspecies. Other smaller drainage courses on the property do not have suitable habitat for arroyo toads, primarily because they are ephemeral and do not support the pools necessary for successful breeding of the arroyo toad..

Arroyo Southwestern Toad Ecology and Distribution

The arroyo southwestern toad (*Bufo microscaphus californicus*) was listed as an endangered species by the U.S. Fish and Wildlife Service (USFWS) on January 17, 1995, and is a California species of special concern. This toad subspecies is restricted to the coastal slopes of southern California and northern Baja California, Mexico, except for one small, isolated population in the Mohave River (Jennings and Hayes 1994). Southern California populations occur on the Sisquoc River, Santa Ynez River, and Mono and Indian Creeks in Santa Barbara County; Sespe Creek, lower Piru Creek, and Agua Blanca Creek in Ventura County; upper Piru Creek, Castaic Creek, and Big Tujunga Canyon in Los Angeles County; and additional drainages in San Bernardino and San Diego Counties (Sweet 1992; USFWS 1998).

Near the proposed Newhall Ranch project, the arroyo southwestern toad has been recently recorded along Castaic Creek, both above and below the dam at Castaic Lake (USFWS 1998). Approximately 50 adult toads were found below the dam over a distance of about 3.2 kilometers (two miles) (USFWS 1998). Arroyo southwestern toads along Castaic Creek are likely affected by exotic aquatic predators (e.g., bull frog), off-road-vehicle activities, recreational activities, potential urban development, and water flow regulation below the dam.

The arroyo southwestern toad has very specific habitat requirements. It inhabits sandy banks of washes, streams, and arroyos with low currents and large, deciduous trees. Within these drainages, arroyo southwestern toads breed in pools with the majority of the pool greater than one foot deep with a substrate of sand, gravel, or pebbles. The pools tend to lack vegetation (Sweet 1992). Arroyo toads are nocturnal and breed from March to June depending on local climate. Females lay between 2,000 and 10,000 eggs in strings in the breeding pools. Larvae metamorphose from tadpoles to toads in 65 to 85 days. Adult toads estivate through the summer in burrows that they dig on sandbars (Jennings and Hayes 1994).

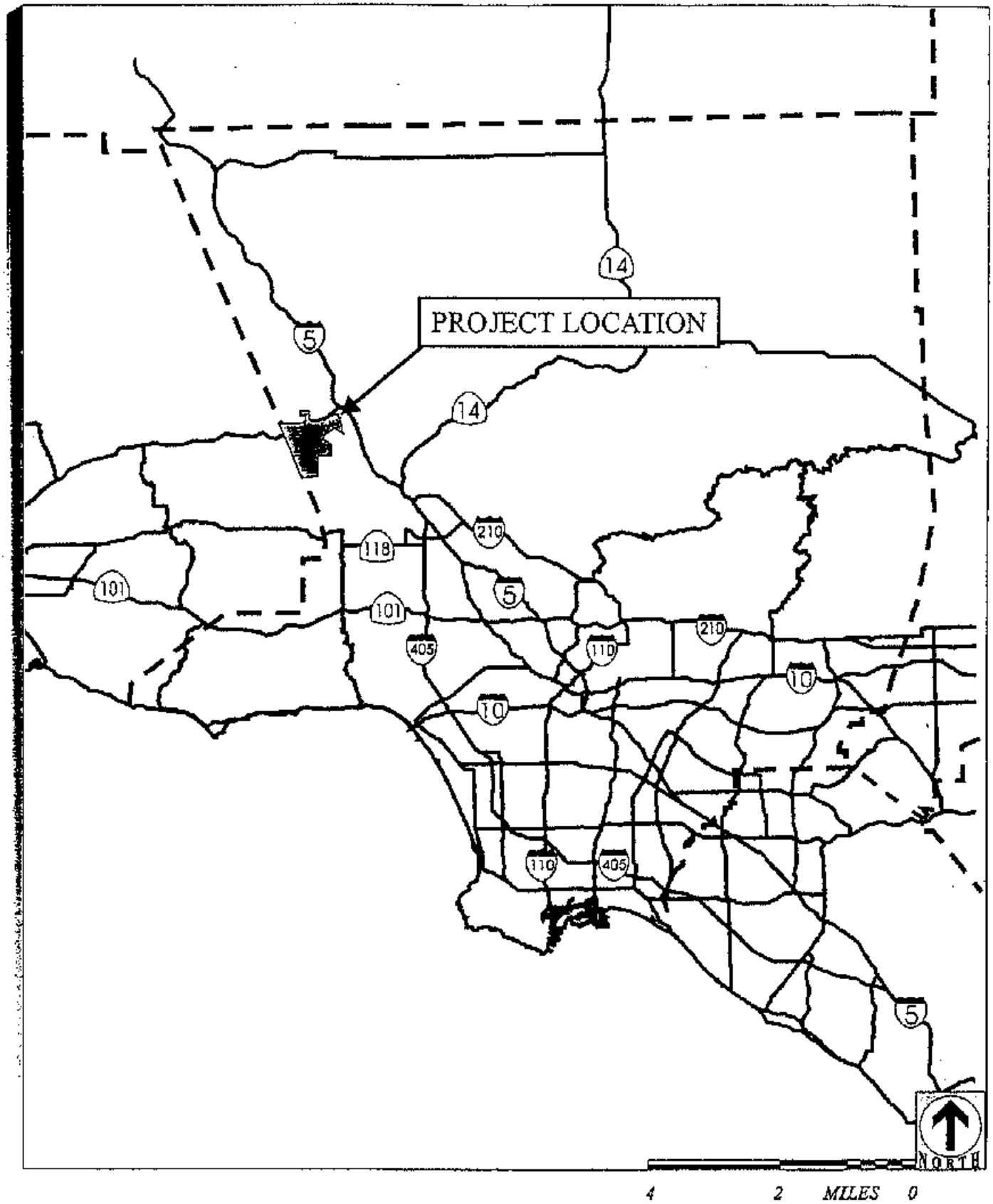

FIGURE 1

Regional Location of the Project

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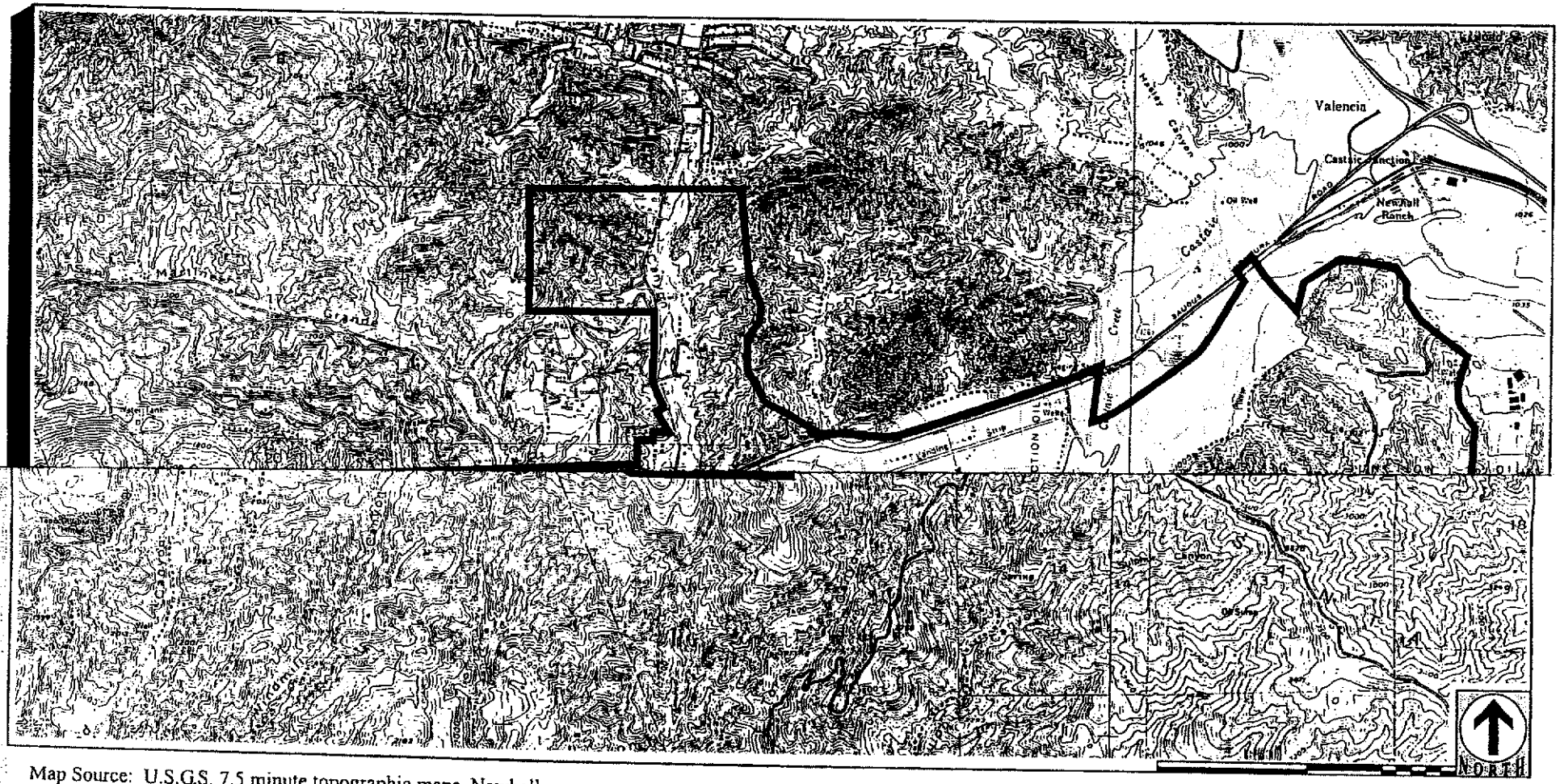

Map Source: U.S.G.S. 7.5 minute topographic maps, Newhall, Val Verde, Oat Mountain, and Simi Valley East

6200 3100 FEET 0

FIGURE 2

Project Vicinity

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Threats to this species include dam construction, flood control, urbanization, and predation by introduced species including bullfrogs (*Rana catesbeiana*) and exotic fishes (50 CRF 17, December 16, 1994).

Survey Methods

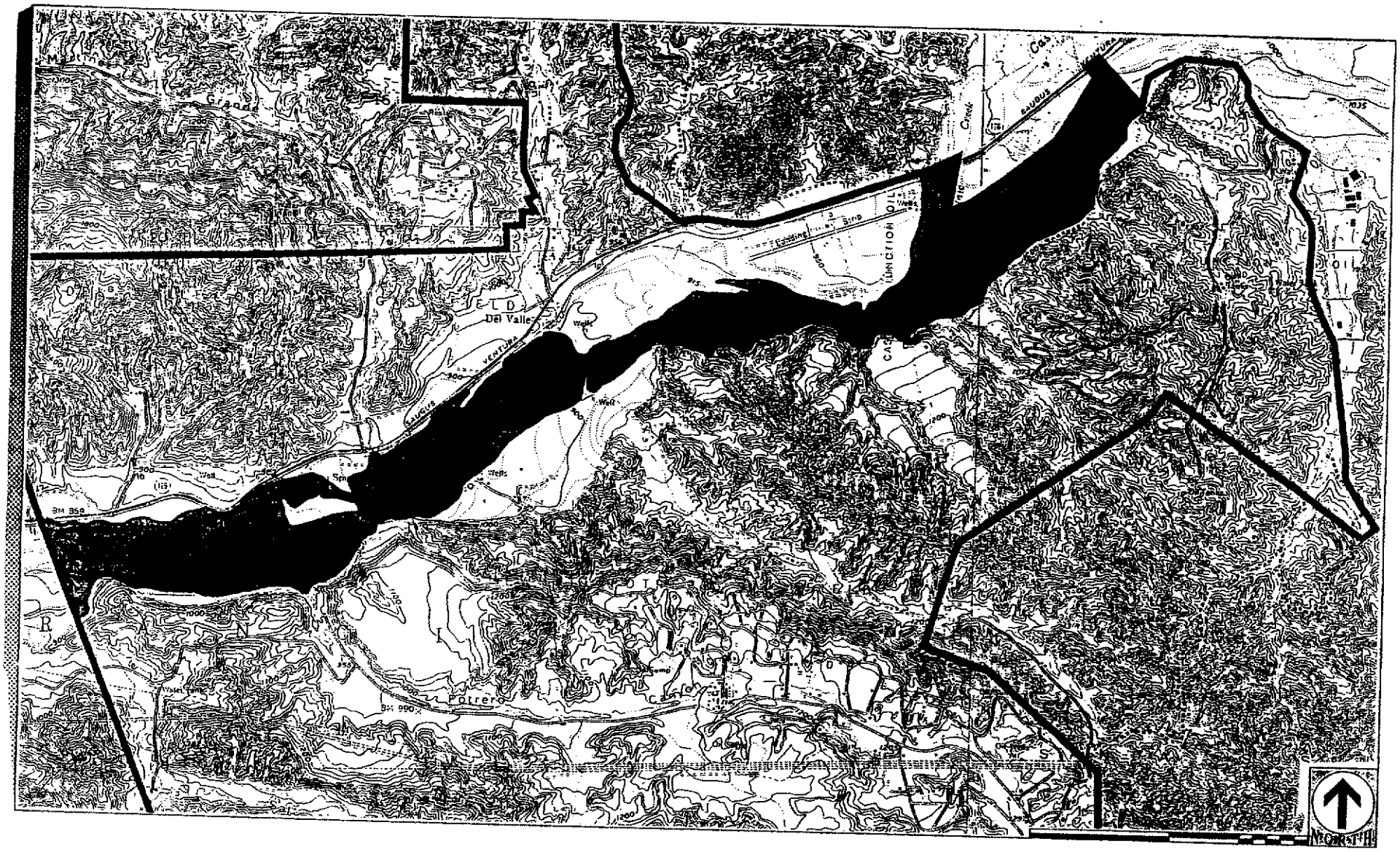
Surveys for arroyo southwestern toads along the portions of the Santa Clara River and Castaic Creek on the Newhall Ranch property were conducted according to the protocol issued by the USFWS in March 1995. All suitable habitat areas along the above-mentioned waterways were surveyed for calling adult male arroyo southwestern toads a minimum of three times during the 1999 breeding season (Table 1). The surveys were conducted between March 15 and May 30 in the evening hours between dusk and midnight. Nights with a full moon, air temperatures less than 55 degrees F., or with adverse weather conditions were avoided. Surveys attempted in mid-March and early April did not meet the survey protocol conditions due to low air temperatures and storm conditions.

Surveys were conducted by walking sections of the river or creek, remaining a safe distance (greater than 10 feet) away from potential breeding pools (Figure 3). Surveyors listened for calls of adult male toads at each location. Local weather conditions, date, time, and other notes were recorded on each visit (see Table 1).

Recent Surveys of Project Area and Results of 1999 Surveys

Surveys to detect arroyo southwestern toads on the Newhall Ranch property were conducted by RECON in March 1994 and April 1995. No arroyo toads were detected during these surveys of the Santa Clara River and Castaic Creek on the property. It was concluded that the potential for arroyo toads to occur in the area was moderate given the presence of suitable habitat, but that population numbers would likely be low.

Surveys conducted between March 15 and May 30, 1999, along the Santa Clara River and Castaic Creek on Newhall Ranch did not detect any calling male arroyo toads. Species that were heard calling or observed included Pacific treefrog (*Hyla regilla*), California treefrog (*Hyla cadaverina*), and California toad (= western toad) (*Bufo boreas halophilus*).



6000 3000 FEET 0

Arroyo southwestern toad survey area

FIGURE 3

Survey Area for Arroyo Southwestern Toad

RECON

TABLE 1
1999 SURVEY INFORMATION FOR ARROYO TOAD ON NEWHALL RANCH

Surveyors	Date	Time	Wind Speed	Air Temperature (F) (dusk)	Water Temperature (F)
Gerry Scheid Wendy Loeffler	April 21, 22	8:00 P.M. – 12:00 A.M.	Calm 0 – 2 mph	58° – 62°	66°
Gerry Scheid Wendy Loeffler	May 16, 17	8:00 P.M. – 12:00 A.M.	Light breeze 5 – 10 mph	66° - 68°	70°
Gerry Scheid Wendy Loeffler	May 26, 27	8:30 P.M. – 12:00 A.M.	Light breeze 5 – 10 mph	68° – 72°	74°

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Conclusion

Although habitat that appears appropriate to support arroyo southwestern toad on the property, none were detected during repeated surveys on the Santa Clara River and Castaic Creek on the Newhall Ranch property. Possible factors for the absence of this species include disturbance from cattle and agriculture along the Santa Clara River, and off-road-vehicle activity, human access, and the regulation of water flows in Castaic Creek. Low population numbers of arroyo toads in the vicinity of the property is also a factor because there is a low potential for dispersal to suitable habitats located downstream due to low overall numbers of individuals.

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Sweet, S.

1992 Initial Report on the Ecology and Status of the Arroyo Toad (*Bufo microscaphus californicus*) on the Los Padres National Forest of Southern California, with Management Recommendations. Contract Report to U.S. Department of Agriculture, Forest Service, Los Padres National Forest, Goleta, California. Revised March.

U.S. Fish and Wildlife Service

1998 Draft Recovery Plan for the Arroyo Southwestern Toad (*Bufo microscaphus californicus*). U.S. Fish and Wildlife Service, Portland, Oregon.

Compliance Biology and Bruyea, Results of Butterfly Surveys on the Newhall Ranch Project Site

compliance·biology

September 16, 2004

Results of Butterfly Surveys on the Newhall Ranch Project Site, Los Angeles County, California.

INTRODUCTION

At the request of Compliance Biology, Inc. (CBI), Guy P. Bruyea conducted a field survey of the above-referenced site in the Santa Clarita area of northwestern Los Angeles County, California. The specific goal of this survey was to assess potential suitability of the Newhall Ranch development area (Newhall Ranch) as habitat to support the San Emigdio blue butterfly (*Plebulina emigdionis*, herein referred to as SEB), a federal species of concern. Additional searches were conducted for habitat that may support the federally endangered Quino checkerspot butterfly (*Euphydryas editha quino*, herein QCB), historically known from other areas of Los Angeles County south of the project site. In addition to surveys for habitat that may support the aforementioned butterfly taxa, a general butterfly inventory was performed during a series of thirty-two site visits in April and May 2004. This report describes the relevant vegetation, topography, and present land use throughout the Newhall Ranch site in an effort to assess the overall quality of the habitat as it pertains to special-status butterfly species and general butterfly diversity on the site.

Survey Location

The ± 4000-acre Newhall Ranch site is generally located west of Six Flags Magic Mountain Park and west of Interstate Highway 5 (I-5) south of the Santa Clara River Basin and Highway 126 (**Exhibit 1**). The site contains a total of ten survey sub areas within the Newhall site, six of these sub areas are south of Highway 126: 1) Potrero Valley; 2) Oak Valley; 3) Onion Fields; 4) Long Canyon; 5) Mesas East; and 6) Mesas West, and four additional survey sub areas are north of Highway 126: 7) River Village; 8) Homestead; 9) Chiquito; and 10) WRP site.

SENSITIVE BUTTERFLY SPECIES BACKGROUND INFORMATION

There are approximately 135 recorded butterfly species from Los Angeles County, of which approximately 120 are considered resident. Some species have adapted well to ornamental landscapes, but many formerly common species have now become increasingly rare over the past few decades due to urban expansion and other factors. Several butterflies presently (and/or historically) found in Los Angeles County are now protected or are considered

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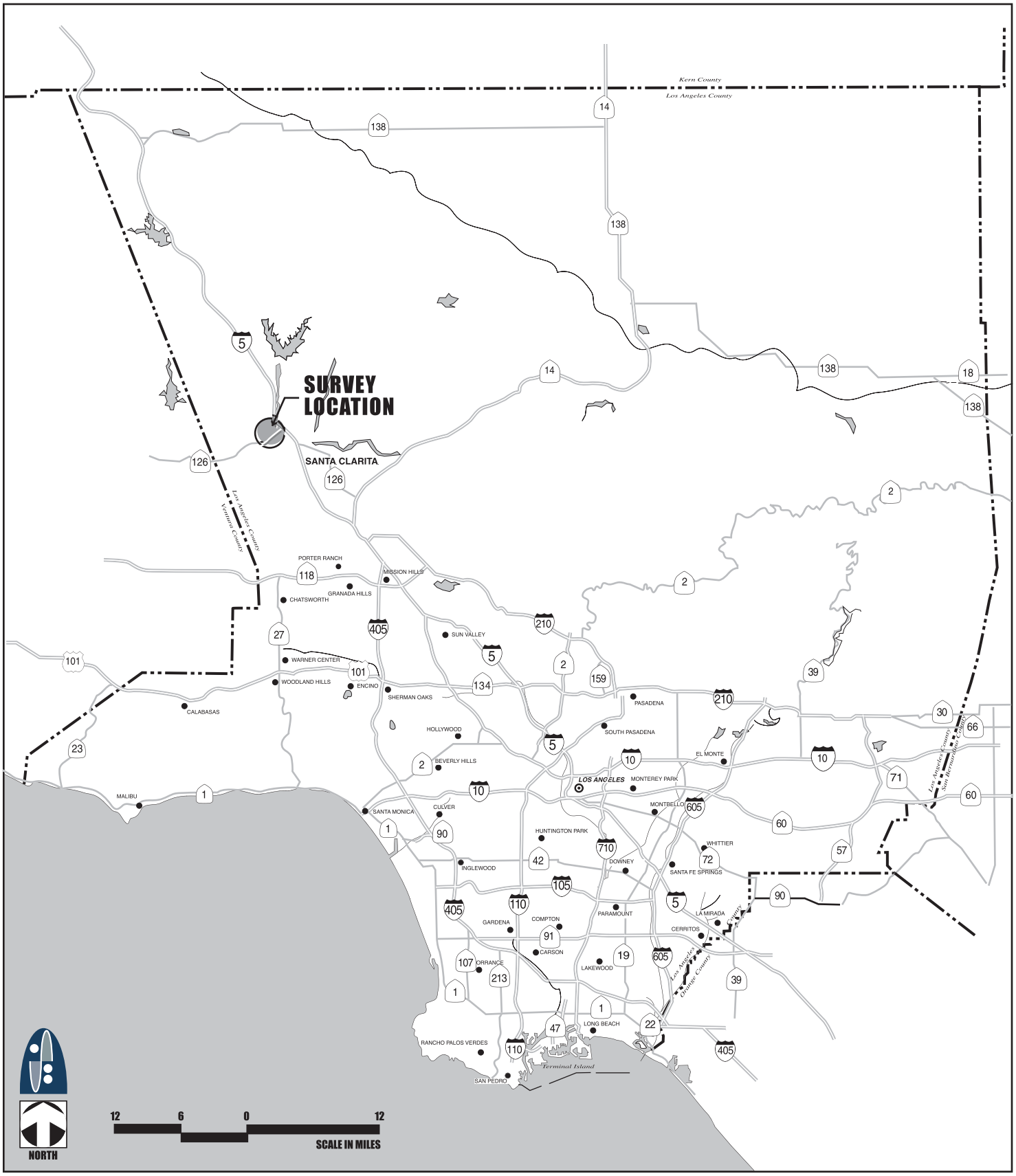

figure 1
Regional Location

species of special concern by federal agencies. Several additional species are considered to be rare by professional entomologists in the region, but are afforded no protection status by any regulatory agencies. A complete list of all sensitive butterfly species is provided in **Table 1**. At least three butterfly species that once occurred in Los Angeles County are now presumably extinct. These include, 1) the unsilvered fritillary (*Speyeria adiaste atossa*), which was last observed near Mt. Pinos in 1959, 2) a very localized race of the Sonoran blue (*Philotes sonorensis*) that once occurred in the upper San Gabriel wash above Azusa (to 1968), and 3) the Palos Verdes blue (*Glaucopsyche lygdamus palosverdesensis*, herein referred to as PVB), which was last observed on the Palos Verdes peninsula in 1983.

Table 1.
Los Angeles County Sensitive Butterflies

Common Name	Scientific Name	Status	Range*
Quino Checkerspot	*Euphydryas editha quino*	FE	N
El Segundo Blue	*Euphilotes battoides allyni*	FE	N
Palos Verdes Blue	*Glaucopsyche lygdamus palosverdesensis*	FE	N
San Emigdio Blue	*Plebulina emigdionis*	[FSC]	Y
Santa Monica Mountains Hairstreak	*Satyrium auretorum fumosum*	[FSC]	N
Emmel's Elfin	*Callophrys mossii hidakupa*	[FSC]	N
Wandering Skipper	*Panoquina errans*	[FSC]	N
Alkali Skipper	*Pseudocopaeodes eunus*	[FSC]	N
Tehachapi Mountains Silverspot	*Speyeria egleis tehachapina*	[FSC]	N
Monarch Butterfly	*Danaus plexippus*	**	Y
Comstock's Blue	*Euphilotes battoides comstocki*	r	N
Bright Blue Copper	*Lycaena heteronea clara*	r	N
Veined Blue	*Icaricia neurona*	r	N
Green (=Skinner's) Blue	*Icaricia lupini chlorina*	r	N
Unsilvered Fritillary	*Speyeria adiaste atossa*	X	N
San Gabriel Mountain Sonoran Blue	*Philotes sonorensis extinctus*	X	N

*Indicates whether survey area is within known historical range of indicated taxon (Y=yes, N=no)
FE=Federally endangered, [FSC]=Federal Species of Concern, r = species considered rare by professional entomologists (no status); X=Presumed extinct (no status), ** Over-wintering (or roosting) sites should be protected, butterfly probably not at risk currently

Three butterfly species known from Los Angeles County are now on the federal list of endangered wildlife. These include the El Segundo blue (*Euphilotes battoides allyni*, herein referred to as ESB), the QCB, and the PVB.

No recent records for QCB exist from Los Angeles County. Populations of QCB are historically known from two locations in the Santa Monica Mountains, 1) Tapia Camp (1947), and 2) Point Dume (1954). Both of these colonies appear to have been extirpated, as adults have not been observed at or in the vicinity of either location since the mid-1950's. Most extant populations of QCB are known from southwestern Riverside County in the vicinity of Temecula and Murrieta, and southern San Diego County in the vicinity of Otay Mountain.

The ESB is restricted to the coastal dune systems in southwestern Los Angeles County. The ESB is presently known from only three locations: 1) the dunes west of the Los Angeles International Airport (LAX); 2) the dunes west of the Chevron Oil refinery immediately south of LAX; and, 3) Malaga Cove north of the Palos Verdes peninsula. This butterfly is strongly associated with the flower heads of its host plant, coastal or dune buckwheat (*Eriogonum parviflorum*). Adults are active in a single brood from mid-July to early September.

The PVB was restricted to the Palos Verdes peninsula where it flew in a single generation during February and March. This butterfly was strongly associated with its principal host plant, milkvetch (*Astragalus trichopodus* var. *lonchus*). The closest relative of the PVB is the southern blue (*Glaucopsyche lygdamus australis*), which occurs throughout most of the remainder of southern California. The southern blue is known to feed in the larval stage primarily on deerweed (*Lotus scoparius*), although larvae occasionally have been found on milkvetch.

The PVB was believed to have become extinct in 1983 when the last known large stand (approximately 120 plants) of milkvetch was eliminated by construction of a baseball field at Hesse Park on the peninsula. In the spring of 1994, a colony of what is considered by some researchers to be the PVB was discovered at a slightly more inland locality on Navy property in San Pedro. At this locality the butterflies are associated with both milkvetch and deerweed. Some researchers maintain that it is possible that genetic differences exist between seaward-facing peninsular populations (PVB) and the extant Navy colony.

Several other butterfly species are considered uncommon in Los Angeles County, some having federal status (i.e., species of special concern), and others that warrant careful monitoring due to declining populations or extremely limited ranges within Los Angeles County. These include the San Emigdio blue (*Plebulina emigdionis*), the Santa Monica Mountains hairstreak (*Satyrium auretorum funosum*), the wandering skipper (*Panoquina errans*), and the Tehachapi Mountain silverspot (*Speyeria egleis tehachapina*).

Several additional butterfly species that appear to be declining (or may be extirpated) in Los Angeles County, but remain common in other areas of their respective ranges include the purplish copper (*Lycaena helloides*), giant copper (*Lycaena xanthoides*), Columella hairstreak (*Strymon columella istapa*), southern sylvan hairstreak (*Satyrium sylvinum sylvinum*), western tailed blue (*Everes amyntula*), coastal arrowhead blue (*Glaucopsyche piasus sagittigera*), California ringlet (*Cenonympha tullia californica*), and sylvan satyr (*Cercyonis sthenele sylvestris*).

Sensitive butterflies considered to have potential for occurrence on the subject property, based on known ranges, the presence of associated vegetation communities, elevations on site, host plant availability within the general vicinity, and other requirements, are discussed in more detail below.

San Emigdio Blue Butterfly (*Plebulina emigdionis*)

The SEB is a federal species of concern and is restricted to southern California in lower Sonoran and riparian habitats from the Owens Valley south to the Mojave River and west to northern Ventura and Los Angeles Counties. This butterfly can be locally abundant in

association with its primary host plant, four-wing saltbush (*Atriplex canescens*). This butterfly has also been observed in association with quail bush (*Atriplex lentiformis*) at scattered locations. The limited distribution of SEB was perplexing to early researchers based on the abundance and widespread distribution of its host plant, which occurs throughout the western United States. SEB larvae have formed a symbiotic relationship with at least one ant species, *Formica pilicornis* (Ballmer *et al*, 1991). This may account for, at least in part, SEB's limited range. These ants presumably extract droplets (containing glucose and amino acids) from the nectary glands of SEB larvae and the ants offer the larvae protection from predators. This relationship is actually quite common among other members of the butterfly family Lycaenidae, to which the SEB belongs. The male butterfly is small (approximately 20-25 millimeters in wingspan) and is blue with a wide brown border on the dorsal wing surface. The slightly larger female is primarily brown with blue at the wing bases and orange bands on the edges of the dorsal wing surface. The ventral wing surface of both sexes is mostly white with small black dots, with smaller blue dots along the hind wing edges.

SEB adults are active from late April to early September. The SEB can have up to three broods per year with the first brood in late April to May, the second brood from late June to early July, and the third brood in August to early September (Emmel et al, 1973). Adults are generally observed perching on their host plant or on other plants in the immediate vicinity, and have also been observed nectaring on nearby flowers. The females deposit single echinoid eggs on the leaves of the host plant after mating. These eggs hatch in about eight to ten days and the larvae begin feeding on the leaves immediately. Diapause normally occurs in the late or last instar of larval development, presumably in the second and/or third broods depending on climatic conditions. The mature larva is variable in color from blue, green, brown, and combinations thereof, and is densely covered with fine white hairs. Retractile glands located on the eleventh larval segment can be protruded when stimulated. Researchers believe these organs are attractive to ants (Emmel et al, 1973).

There are several other Lycaenid butterflies classified as 'blues' (subfamily Polyommatinae) that occur with the SEB in portions of its range. Some of these species are similarly sized and have markings that can be easily confused with SEB. Commonly observed sympatric butterfly species include the blue copper (*Lycaena heteronea*), southern blue (*Glaucopsyche lygdamus australis*), Boisduval's blue (*Icaricia icaroides*), acmon blue (*Icaricia acmon*), western tailed-blue (*Everes amyntula*), marine blue (*Leptotes marina*), pigmy blue (*Brephidium exilis*), Bernardino blue (*Euphilotes bernardino*), and square-spotted blue (*Euphilotes battoides*). SEB can be initially distinguished from many of these species by its relatively large size and its strong association with four-wing saltbush or quail bush.

Due to its extremely limited distribution in southern California and its propensity for isolated small colonies, the SEB can be easily impacted by anthropogenic disturbances. Many colonies in the Mojave Desert and Owens Valley are isolated and are probably not under any immediate threat, but other colonies found closer to growing desert communities and suburban Los Angeles cities are situated near major roads, railroad tracks and other developments, which may contribute to further decline. Some of these populations have already been extirpated; others are threatened by these impacts.

Some of the known localities for this species include the Lower Haiwee Reservoir in Inyo County, Mojave River area near Victorville, and Bouquet and Mint Canyons in Los Angeles County. It is thought that populations in the Mint Canyon area near Santa Clarita were extirpated in the late 1980's and early 1990's. However, Guy Bruyea did observe one extant SEB population in nearby Soledad Canyon as recently as August 1999.

Quino Checkerspot Butterfly (*Euphydryas editha quino*)

The United States Fish and Wildlife Service (Service) added this rare butterfly to the federal list of endangered wildlife in early 1997. The QCB is a geographic race (subspecies) of *Euphydryas editha*, whose combined ranges extend from northern Baja California to Canada along the Pacific coast, and east to Colorado (Bauer, 1975). This subspecies is presently known to exist only as several, probably isolated, colonies in southwestern Riverside County, southern San Diego County and northern Baja California, Mexico.

This butterfly is associated with sparsely vegetated or bare areas usually characterized by clay or cryptobiotic soil deposits that develop a hard crust within southern California sage scrub vegetation communities. Low-growing herbaceous annuals including the QCB's primary larval host plant, dot-seed plantain, *Plantago erecta* (Plantaginaceae), typically inhabit these areas. Other potential QCB host plants (considered secondary) may occupy these areas and include owl's clover (*Castilleja exserta*) and white snapdragon (*Antirrhinum coulterianum*), both in the plant family Schrophulariaceae.

Focused surveys for the QCB were not conducted as part of this survey as they are not expected to occur. Mr. Bruyea currently holds a valid section 10(a)(1)(A) QCB recovery permit for QCB issued under the Endangered Species Act of 1973, as amended (Permit Number TE-837439-4).

Monarch Butterfly (*Danaus plexippus*)

The widespread monarch butterfly can be observed throughout southern California in the coastal, lowland, and foothill areas, and occasionally in desert and mountain areas where it larval host plant, various milkweeds (genus *Asclepias*), occurs. Monarchs are renowned migrants, and large numbers can be observed along the California coast in the fall months as they migrate to overwintering sites along the California coast and into Mexico. A few California sites (e.g. Pacific Grove) support concentrated numbers of the overwintering adults on trees; usually the adults hibernate as scattered individuals or in small clusters (Emmel et al, 1973).

Although the monarch butterfly may be declining due to land conversion and loss of larval host plant resources throughout its range, populations of this butterfly appear to be stable. However, existing and potential over-wintering sites along the southern California coast supporting large trees (primarily Eucalyptus and/or Pines) are considered important for the long-term survival of western United States populations.

METHODS

The Newhall Ranch site was surveyed for a total of thirty-two person-days by Guy Bruyea and CBI associate biologists Gregory Chatman, Bill Gendron, Andrew Carmichael, Jessica Turner, David Hawks, Patrick Luft, and Dean Wagner on April 10, 21, 25, 29, 30, May 2, 5, 6, 9, 16, 19, and 20, 2004. Date and times of the survey visits, weather conditions at the start and end of each survey period, and survey results are summarized in Table 2.

Table 2.
Newhall Ranch Site Butterfly Survey Information
April-May 2004

Date	Time PST	Weather	Wind	Biologists	Results
4/10	0900-1500	Sunny, 64-78 °F	0-3	AC, JT, PL, DW	No sensitive species observed
4/21	0900-1500	Ptly Cldy, 63-78 °F	0-2	GC, BG	No sensitive species observed
4/25	0900-1500	Sunny, 62-80 °F	0-2	GC, BG, DW, DH	No sensitive species observed
4/29	0900-1500	Sunny, 72-83 °F	1-2	GB, PL	No sensitive species observed
4/30	0900-1500	Sunny, 75-88 °F	1-3	GC, BG	No sensitive species observed
5/02	0900-1500	Sunny, 76-95 °F	1-3	AC, JT, GB	**SEB observed** Oak Valley
5/05	0900-1500	Sunny, 75-90 °F	0-2	GC, BG	No sensitive species observed
5/06	0900-1500	Sunny, 74-91 °F	0-2	GB, DW	No sensitive species observed
5/09	0900-1500	Sunny, 78-88 °F	0-3	AC, JT, GB, BG	No sensitive species observed
5/16	0900-1500	Sunny, 72-82 °F	0-1	GC, BG, GB	**SEB observed** Oak Valley
5/19	0900-1500	Sunny, 73-79 °F	0-3	GC, BG	No sensitive species observed
5/20	0900-1500	Ptly Cldy, 62-73 °F	1-2	GB, PL	No sensitive species observed

Biologists: GB (Guy Bruyea), GC (Gregory Chatman), BG (Bill Gendron), AC (Andrew Carmichael), JT (Jessica Turner), DH (David Hawks), PL (Patrick Luft), and DW (Dean Wagner)

The primary focus of this survey was to determine the presence or absence of SEB, QCB and their associated host plants. Special consideration was given to areas supporting native vegetation that may include specific larval host plant habitat requirements for any of the aforementioned sensitive species. The presence or absence of invasive, non-native plant species was noted in an effort to assess the level of previous disturbance in a given area. Other habitat requirements including the presence of potential nectar resources and the

overall quality of the site as it pertains to potential QCB topographical resources (i.e., hilltops) were assessed.

This field survey was conducted during daylight hours from 0900 to 1500 Pacific Daylight (Savings) Time. Temperatures recorded during the survey ranged from 62 to 93 °F (degrees Fahrenheit) and conditions varied from clear to partly cloudy with little or light winds (at or less than 1 Beaufort scale). Guy Bruyea and CBI associate biologists identified all butterfly species in the field. Other wildlife species (including other invertebrates) were identified in the field or later identified using various texts.

Daily weather data were noted on field forms and/or a digital audio recorder approximately once per hour during survey visits. Weather data were recorded using a digital anemometer (Beaufort scale of wind speed measurement), thermometer, and by visual observation and estimation of cloud cover and other pertinent daily weather characteristics (rain, drizzle, marine layer, etc.). Digital recordings were later transcribed to field forms.

Not all plants and/or associated butterfly species that may have been present on site were necessarily observable (or identified) during this survey. For an exhaustive assessment of the butterfly fauna of a given area, surveys would be required throughout the year. Guy Bruyea and CBI associate biologists general knowledge of the butterfly diversity for this area was utilized in an effort to locate specific habitats for some butterfly species. A California Natural Diversity Database (CNDDB) records search was conducted prior to the start of this survey to determine the probability that sensitive butterfly species may be present on the site.

Nomenclature used in this report was primarily derived from Hickman (1993) for plants; Emmel et al. (1973), Howe (1975), and Emmel (1998) for butterflies; and Arnett (2000) for other insects. Additional resources are listed at the end of this report.

Site Description

Much of the site supports a mixture of disturbed and relatively undisturbed coastal sage chaparral scrub and coastal sage scrub. Oil wells, pipelines, associated structures, access roads (primarily unimproved) and other associated disturbances are present throughout the Potrero Valley sub area, but these occupy a relatively small portion of the overall survey area.

Other undeveloped lands associated with the Newhall Ranch Project (Stevenson Ranch Phase V and Magic Mountain Entertainment sub areas) occur to the east of the subject property. Guy Bruyea and CBI biologists conducted special-status butterfly surveys on both of these sub areas of the Newhall Project in April and May 2004.

Topographically, the site is characterized by gently to steeply sloping hills and ridgelines with a mixture of shallow to steep canyons and flat mesa areas. Adjacent lands contain a mixture of flat areas associated with the Santa Clara River basin, or significant topographic relief in association with the Santa Susana Mountains. The Newhall Ranch site has a combined maximum vertical relief of roughly 900 feet between its highest and lowest on-site

elevation points. Elevations on the site range from approximately 900 to 1800 feet above mean sea level.

Land use varies considerably within and adjacent to the survey area, and includes anthropogenic disturbances associated with Six Flags Magic Mountain Park east of the site, and other human-related disturbances such as actively cultivated in-use agricultural fields, oil fields, fallow fields, industrial and commercial areas, paved and unimproved roads, transmission lines, and other developments. Other less disturbed areas containing a mixture of coastal sage chaparral scrub and other vegetation communities are present surrounding the subject property. Areas to the southeast of the site (adjacent to the Phase V (not a part) sub area) contain recently constructed high-density residential developments.

Vegetation Characteristics

The subject property is mostly undisturbed away from roads (both improved and unimproved) and activities related to existing oil wells, although low-growing weedy annuals have invaded the native understory throughout the site, possibly out-competing many native low-growing forbs. The site is inhabited with a mixture of coastal sage scrub, coastal sage chaparral scrub, valley oak woodland, open coast live oak woodland, and riparian vegetation communities. Cleared or disturbed areas are present in association with farming, cattle grazing, existing roads and other developments, and disking was observed on a portion of the site during the current study. The northwestern portion of the site (primarily the Homestead sub area) is in various stages of recovery as a result of the "Verdale Fire," which burned approximately 8,700 acres in October 2003.

Coastal Sage Scrub (Holland Element Code 32200)

Coastal sage scrub (CSS) contains mostly drought-deciduous shrubs with small leaves. CSS is primarily defined by the presence of California buckwheat (*Eriogonum fasciculatum*) and/or California sagebrush (*Artemisia californica*). Several large patches of relatively undisturbed CSS occur in areas not historically cleared. Relatively few associated CSS shrubs and other plants were present, but did include white sage (*Salvia apiana*), blue elderberry (*Sambucus mexicana*), wooly aster (*Lessingia filaginifolia*), chaparral yucca (*Yucca whipplei*), and deerweed (*Lotus scoparius*).

Non-native grasses occurring abundantly in these areas of the site included slender wild oats (*Avena barbata*), ripgut (*Bromus diandrus*), and foxtail chess (*Bromus madritensis* ssp. *rubens*).

A matrix of open patches can be found throughout areas inhabited with CSS on site, containing a mixture of native and non-native low-growing annuals including owl's clover (*Castilleja exserta*), clarkia (*Clarkia* sp.), lupine (*Lupinus* sp.), and whispering bells (*Emmenanthe penduliflora*). Diversity of native annuals appeared relatively low on the subject property, probably due to the presence of invasive and dense non-native vegetation. However, due to the timing of the current survey, the presence or absence of many annual plant species within these open patches could not be adequately assessed.

Coastal Sage-Chaparral Scrub (Holland Element Code 37G00)
Coastal sage-chaparral scrub (CSCS) contains a mixture of sclerophyllous low chaparral shrubs and drought-deciduous sage scrub species, and is regarded as an ecotone between the two communities. These areas include floristic elements of both coastal sage scrub and lower chaparral, including shrubs such as California buckwheat, California sagebrush, chamise (*Adenostoma fasciculatum*), purple sage (*Salvia leucophylla*), and white sage (*Salvia apiana*).

Scattered throughout this vegetation community, within less dense (and open) areas, are native species including blue elderberry, sapphire woolstar (*Eriastrum sapphirinum*), tarplant (*Hemizonia* sp.), bush mallow (*Malacothamnus fasciculatus*), wooly aster (*Lessingia filaginifolia*), wishbone bush (*Mirabilis californica*), and other herbaceous annuals.

Open Coast Live Oak Woodland (Holland Element Code 71161)
This habitat type is consists of evergreen woodland dominated by low-density coast live oak (*Quercus agrifolia*) trees, found mostly on north-facing slopes and shaded ravines. A diverse shrub understory is usually present.

A small grove of mature coast live oak trees was observed at the extreme eastern portion of the Potrero Valley sub area. This grove continues offsite east into the Phase V sub area. Understory plants primarily consisted of non-native grasses and other weedy annuals.

Southern Cottonwood/Willow Riparian (Holland Element Code 61320)
Mulefat Scrub (Holland Element Code 63310)
Disturbed Wetland (Holland Element Code 11200)
Southern cottonwood/willow riparian and mulefat scrub are dependent on periodic flooding and are characterized by the presence of mostly winter deciduous trees, including willow (*Salix* species), mulefat (*Baccharis salicifolia*), and Fremont's cottonwood (*Populus fremontii*).

A mixture of intact and partially degraded riparian areas is located within Potrero Canyon and other areas of the site. The understory is inhabited with a mixture of native and non-native plants.

Disturbed / Ruderal Habitat (Holland Element Code 11300)
Disturbed/ruderal (weedy) habitat includes areas dominated with non-native plant species such as ornamental and invasive exotic species. Non-native, weedy species are predominant in most open areas of the site, especially within the Potrero Valley and Onion Fields sub areas. The most common invasive plants observed included short-pod mustard (*Hirschfeldia incana*), horehound (*Marrubium vulgare*), tocalote (*Centaurea melitensis*), cheeseweed (*Malva parviflora*), sourclover (*Melilotus indica*), Indian clover (*Lotus purshianus*), and filaree (*Erodium* sp.). Other plants including Russian thistle (*Salsola tragus*), doveweed (*Eremocarpus setigerus*), prickly lettuce (*Lactuca serriola*), jimsonweed (*Datura wrightii*), telegraph weed (*Heterotheca grandiflora*), and various non-native grasses including foxtail chess, slender wild oat, and other unidentified grass species. A few native species that are tolerant of disturbance such as fiddleneck (*Amsinckia menziesii*) and dove lupine (*Lupinus bicolor*) were locally abundant along road and trail margins, and in other open areas of the site.

Extensive Agriculture (Fields) (Holland Element Code 18300)
Portions of the survey area have been converted for agricultural use and contain a mixture of wheat, onion, and other crops. Some invasive plants were observed within these fields, including lamb's quarters (*Chenopodium* sp.), wild heliotrope (*Heliotropium curassavicum*), calabazilla (*Cucurbita foetidissima*), and knotweed (*Polygonum aviculare*). Agricultural areas are primarily located within the River Village sub area at the northern portion of the survey area just north of the Santa Clara River basin. Additionally, portions of the Oak Valley, Onion Fields, and Mesas West sub areas have lands converted for agricultural use.

RESULTS

No SEB were observed within the Potrero Valley, Onion Fields, Long Canyon, Mesas East, Mesas West, Homestead, River Village, Chiquito and WRP sub areas during the present study. This species is strongly associated with its larval host plant where it occurs, and no suitable patches of *Atriplex* were observed within the Potrero Valley, Long Canyon, Onion Fields, Mesas East, Mesas West, River Village, Chiquito and WRP sub areas. Patches of *Atriplex lentiformis* were observed lining the entire onsite portion of San Martinez Grande Canyon within the Homestead sub area, but no SEB were observed at this location after careful searching during four person-day visits on days suitable for potential SEB activity. Although suitable larval host plant habitat is present within the Homestead sub area, it appears that other SEB habitat requirements are not supported based on the results of this survey.

SEB was observed within Potrero Canyon at the north-central edge of the Oak Valley sub area on two dates (May 2 and May 16) during this study. This SEB colony is strongly associated with *Atriplex lentiformis* where two low-relief drainages converge just north of the Santa Clara River basin and gated site boundary (**Exhibit 2**). It is estimated that approximately twenty adult SEB were observed perched on *Atriplex* plants at this location during the present study.

Although historic records exist for areas southeast of the site in Bouquet, Soledad and Mint canyons, this species is presumed extirpated from most areas east of the site due to increased human-related activities including commercial and residential developments, agricultural operations, ORV use, and other disturbances. It is our understanding that the SEB colony observed within the Oak Valley sub area during this study may in fact represent one of the westernmost known occupied localities for this species (David Hawks, pers. comm.).

The present study indicates that most sub areas of the Newhall site, with the exception of the northern portion of Oak Valley, do not currently support potential habitat for SEB. This conclusion is primarily based on the absence of suitable *Atriplex* patches throughout a majority of the Newhall survey area, and the results of the current butterfly survey conducted during the SEB flight season. Additionally, the lack of historical SEB data from this region of Los Angeles County west of I-5 further illustrates its rarity in the region.

Based on the results of the present study, it can be reasonably concluded that the Potrero Valley, Onion Fields, Long Canyon, Mesas East, Mesas West, River Village, Chiquito and WRP sub areas do not support suitable SEB habitat and that SEB is not expected to occur within these sub areas. Although suitable habitat appears to be present, SEB is not expected to occur within the Homestead sub area based on the results of this study. Additionally, SEB is not expected to occur within disturbed or sage scrub areas away from drainages and suitable *Atriplex* habitat within the Oak Valley sub area. SEB may occupy areas just offsite within the Salt Canyon area where extensive patches of *Atriplex* are known to occur.

The present study indicates that the property does not currently support high quality potential habitat for QCB. This conclusion is primarily based on the lack of historical QCB data from this region of Los Angeles County, and the apparent absence of its primary host plant, dot-seed plantain, which was not detected on site during this survey. Additionally, QCB was historically known from two locations in the Santa Monica Mountains approximately 25 to 30 miles south and southwest of the subject property, but has not been observed in those areas since 1954. Extant QCB populations are found much further south and southeast in Riverside and San Diego Counties. It is highly unlikely that QCB once occupied the Santa Clarita area due to a lack of records indicating its presence in the northern portion of Los Angeles County. Therefore, it can be reasonably concluded that the subject property does not support suitable QCB habitat and that QCB is not expected to occur on site.

Individual monarch butterflies were observed on the subject property during the present study. Milkweeds (*Asclepias* sp.) may be present on or near the subject property, and would be available as a potential oviposition site for passing females. However, due to the site's distance away from coastal areas, it is highly unlikely that the site would be utilized by large numbers of overwintering adults.

With the exception of the SEB colony observed within the Oak Valley sub area during this study, it is our understanding that no recent data suggest that occupied habitat exists on any other portion of the Newhall site for the sensitive butterfly species discussed in this report and based on the survey results, none are expected to occur.

Other Lepidoptera Observations

A total of thirty-seven (37) common butterfly species were observed on the property during the present survey (Table 3). In general the Newhall site appears to support habitat conducive to a good diversity of butterfly fauna. Many butterflies were uncommon, however, and other species expected to occur on the site were not observed. This may be due, in part, to relatively dry conditions throughout the late spring months just prior to the survey, and/or the time limits of the present study.

Table 3.
Newhall Ranch Site Lepidoptera Observations

Common Name / Scientific Name	Notes
Anise Swallowtail (*Papilio zelicaon*)	Uncommon on ridgelines and hilltops
Western Tiger Swallowtail (*Papilio rutulus*)	Uncommon; riparian areas
Checkered White (*Pontia protodice*)	Common; all areas
Cabbage White (*Pieris rapae*)	Common; riparian and shaded areas
Becker's White (*Pieris beckeri*)	Uncommon; associated with *Isomeris arborea*
Alfalfa Butterfly (*Colias eurytheme*)	Common; especially within or near agricultural areas
Harford's Sulfur (*Colias alexandria harfordii*)	Uncommon in native habitats only
Sara Orange-tip (*Anthocharis sara*)	Common; especially in canyons and small drainages
Painted Lady (*Vanessa cardui*)	Abundant throughout site; migratory
Red Admiral (*Vanessa atalanta*)	Common, especially near *Urtica* patches in riparian
West Coast Lady (*Vanessa annabella*)	Common throughout site
Chalcedon Checkerspot (*Euphydryas chalcedona*)	Common; especially on ridgelines and hilltops
Gabb's Checkerspot (*Charidryas gabbii*)	Uncommon; native areas inhabited with *L. filaginifolia*
Lorquin's Admiral (*Basalarchia lorquini*)	Uncommon; riparian areas inhabited with *Salix*
California Sister (*Adelpha bredowii californica*)	Common; strongly associated with oaks (*Quercus* sp.)
Buckeye (*Junonia coenia*)	Common throughout site
Monarch (*Danaus plexippus*)	Uncommon throughout site
California Ringlet (*Cenonympha tullia californica*)	Rare on site; associated with native grasslands
Funereal Duskywing (*Erynnis funeralis*)	Common throughout site
Mournful Duskywing (*Erynnis tristes*)	Uncommon; associated with oaks (*Quercus* sp.)
Western Checkered Skipper (*Pyrgus communis albescens*)	Common throughout site
Large White Skipper (*Heliopetes ericetorum*)	Common in native habitats
Rural Skipper (*Ochlodes agricola*)	Common in native habitats
Sandhill Skipper (*Polites sabuleti*)	Common; strongly associated with saltgrass (*Distichlis*)
Behr's Metalmark (*Apodemia mormo virgulti*)	Abundant; strongly associated with *E. fasciculatum*
Fatal Metalmark (*Calephelis nemesis*)	Uncommon; observed on Chiquito sub area only
Southern Blue (*Glaucopsyche lygdamus australis*)	Uncommon in 2004; usually common in canyons
Acmon Blue (*Icaricia acmon*)	Common throughout site including disturbed areas
Lupine Blue (*Icaricia lupini*)	Rare on site; associated with *Eriogonum*
San Emigdio Blue (*Plebulina emigdionis*)	Rare; strongly associated with *Atriplex* and certain ants
Bernardino Blue (*Euphilotes bernardino*)	Common; strongly associated with *E. fasciculatum*
Pigmy Blue (*Brephidium exilis*)	Abundant throughout site including disturbed areas
Western-tailed Blue (*Everes amyntula*)	Rare on site; associated with *Astragalus*
Great Copper (*Lycaena xanthoides*)	Uncommon; observed on Chiquito sub area
Common Hairstreak (*Strymon melinus*)	Common throughout site
Great Purple Hairstreak (*Atlides halesus*)	Uncommon; associated with mistletoe (*Phorodendron* sp.)
Western Elfin (*Incisalia augustinus iroides*)	Uncommon on site in native habitats only
37 Species Total	

Butterfly species commonly observed during the present study included painted lady (*Vanessa cardui*), California sister (*Adelpha bredowii californica*), sara orange-tip (*Anthocharis sara*), cabbage white (*Pieris rapae*), pigmy blue (*Brephidium exilis*), funereal duskywing (*Erynnis funeralis*), and large white skipper (*Heliopetes ericetorum*). Other butterflies frequently observed included alfalfa sulfur (*Colias eurytheme*), buckeye (*Junonia coenia*), west coast lady (*Vanessa annabella*), acmon blue (*Icaricia acmon*), and Behr's metalmark (*Apodemia mormo virgulti*). The site and survey area includes topographic features such as ridgelines and prominent hilltops, which can be considered significant as potential hilltopping sites for butterflies in the immediate area. Common hilltopping species observed on scattered hilltops throughout the Newhall site include chalcedon checkerspot (*Euphydryas chalcedona*), anise swallowtail (*Papilio zelicaon*), and checkered white (*Pontia protodice*).

Interestingly, California ringlet was observed on the Mesas East sub area within the Newhall Ranch site during this study. Although this species remains relatively common throughout portions of its range, populations are declining in Los Angeles County. Guy Bruyea observed one additional California ringlet on the Magic Mountain Entertainment site approximately 0.5 to 1 mile east of the subject property during 2004 butterfly surveys.

Several great copper (*Lycaena xanthoides*) were observed within the Chiquito sub area. Due to urban expansion and confinement of natural creek flow patterns throughout Los Angeles County, this butterfly has become increasingly uncommon in this region of southern California. The flight season of this single-brooded butterfly is typically in April and May, and into June and July at upper elevations. The larval host plant is various *Rumex* species, which were observed commonly on the subject property. This species is now mostly confined to the mountain foothills of the Santa Ana Mountains in Los Angeles County (Mattoni, 1990).

Additional butterfly species are expected to occur on site not observed during the present study due to seasonal restrictions and other factors. A complete list of butterfly species with potential for occurrence, based on the vegetation present, the site's location, and other factors, is included as part of this report (Appendix A).

CONCLUSIONS

During the thirty-two day survey effort, the entire Newhall Ranch site was specifically surveyed for the sensitive butterfly species described above. Additionally, a general butterfly inventory (both observed and expected to occur) was performed. Based on seasonal precipitation patterns in the late winter and spring months of 2004, butterfly activity was considered relatively 'productive' for most species based on the results of this study.

An SEB colony was observed at the northwest edge of the Oak Valley sub area during the present study in association with patches of its larval host plant, *Atriplex lentiformis*. Based on the absence of SEB larval host plant patches and the absence of SEB adult observations throughout all other sub areas of the Newhall Ranch site during the present study, and other

information presented in the above report, it can be reasonably concluded that SEB is not currently present and is not expected to occur within the Potrero Valley, Onion Fields, Long Canyon, Mesas East, Mesas West, River Village, Homestead, Chiquito, and WRP sub areas.

Due to the lack of recent QCB observations for Los Angeles County, the apparent absence of primary larval host plants (i.e. *P. erecta*) and lack of suitable high quality habitat, and the site location (not known to be within the historical range of QCB), it is highly unlikely that a QCB breeding population or the occasional dispersing individual QCB would utilize the subject property.

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Certification and Signature Page

± 4000-acre Newhall Development Site
Los Angeles County, California
September 16, 2004

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

_____ Date _____

Dave Crawford, Principal Biologist
Compliance Biology, Inc.
1936 N. Croydon Ave.
Camarillo, CA 93010

_____ Date _____

Guy P. Bruyea, Principal Biologist
Bruyea Biological Consulting
43146 Sampson Court
Hemet, CA 92544

Appendix A

Butterfly Species with potential for occurrence on the **Newhall Ranch** Site
Los Angeles County, California
June 2004

Observed butterfly species (N=29) are indicated with an asterisk. Two asterisks indicate special status and/or narrow-endemic species. Butterfly species included on this list have varying degrees of potential for occurrence on the subject property. Potential for occurrence is based on a combination of known range (historical and present), host plant presence/absence, and other factors. Not all butterfly species that may be resident on the site were necessarily observed during this survey. For an exhaustive butterfly assessment, surveys are best performed from February to September to achieve a thorough inventory.

Family / Scientific Name	Common Name
Order Lepidoptera	Butterflies and Moths
Papilionidae	**Swallowtails**
Papilio rutulus	Western Tiger Swallowtail*
Papilio eurymedon	Pale Swallowtail*
Papilio zelicaon	Anise Swallowtail*
Nymphalidae	**Brush-footed Butterflies**
Danaus gilippus	Striated Queen
Danaus plexippus	Monarch*
Ceononympha tullia californica	California Ringlet
Agraulis vanillae incarnata	Gulf Fritillary
Basilarchia lorquini	Lorquin's Admiral*
Adelphia bredowii californica	California Sister*
Euphydryas chalcedona	Chalcedon Checkerspot*
Junonia coenia	Buckeye*
Charidryas gabbii	Gabb's Checkerspot*
Phyciodes mylitta	Mylitta Crescent
Polygonia satyrus	Satyr Anglewing
Nymphalis californica	California Tortoise-shell
Nymphalis milberti	Milbert's Tortoise-shell
Nymphalis antiopa	Mourning Cloak
Vanessa virginiensis	Virginia Lady
Vanessa atalanta	Red Admiral*
Vanessa cardui	Painted Lady *
Vanessa annabella	West Coast Lady*
Riodinidae	**Metalmarks**
Apodemia mormo	Mormon Metalmark*

Appendix A (continued)

Family / Scientific Name	Common Name
Order Lepidoptera	Butterflies and Moths
Lycaenidae	**Blue, Hairstreaks, Coppers**
Atlides halesus	Great Purple Hairstreak
Callophrys perplexa	Bramble Hairstreak
Euphilotes bernardino	Bernardino Blue*
Incisalia augustinus iroides	Western Elfin*
Icaricia acmon	Acmon Blue *
Icaricia lupini	Lupine Blue*
Plebulina emigdionis	San Emigdio Blue*
Everes amyntula	Western Tailed-blue*
Glaucopsyche lygdamus australis	Southern Blue*
Hemiargus ceraunus gyas	Edward's Blue
Hemiargus isola alce	Reakirt's Blue
Leptotes marina	Marine Blue
Brephidium exilis	Pigmy Blue *
Lycaena xanthoides	Great Copper
Satyrium californica	California Hairstreak
Satyrium sylvinus sylvinus (or *sylvinus dryope*)	Sylvan Hairstreak
Strymon melinus	Common Hairstreak*
Pieridae	**Whites and Sulfurs**
Colias eurydice	California Dogface
Colias alexandra harfordii	Harford's Sulfur*
Colias eurytheme	Alfalfa Sulfur *
Nathalis iole	Dwarf Yellow
Anthocharis cethura	Felder's Orange-tip
Anthocharis sara sara	Sara Orange-tip *
Eurema nicippe	Nicippe Yellow
Phoebis sennae	Cloudless Sulfur
Pontia protodice	Checkered White *
Artogeia rapae	Cabbage White *
Hesperiidae	**Skippers**
Lerodea eufala	Eufala Skipper
Paratrytone melane	Umber Skipper
Hylephila phyleus	Fiery Skipper
Atalopedes campestris	Field Skipper
Ochlodes agricola	Rural Skipper*
Polites sabuleti	Sandhill Skipper*
Erynnis funeralis	Funereal Duskywing*

Appendix A (continued)

Hesperiidae (Continued)	**Skippers**
Erynnis tristes	Mournful Duskywing†
Heliopetes ericetorum	Large White Skipper*
Pyrgus communis albescens	West. Checkered Skipper*

URS, Jurisdictional Delineation Newhall Ranch Project

DRAFT

JURISDICTION DELINEATION NEWHALL RANCH PROJECT

FOR A PORTION OF THE SANTA CLARA RIVER AND ITS TRIBUTARIES LOS ANGELES COUNTY, CALIFORNIA

Prepared for:

U.S. Army Corps of Engineers
California Department of Fish and Game

Prepared by:

The Newhall Land and Farming Company

With technical and administrative assistance of:

URS

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September 2003

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This Draft Jurisdiction Delineation Package (Draft Package) has been prepared by Newhall Land and Farming Company (Newhall Land) in cooperation with agency representatives from the U.S. Army Corps of Engineers (Corps) and the California Department of Fish and Game (CDFG), in support of the Newhall Ranch project Corps 404 and CDFG 1603 permitting processes. The purpose of this package is to facilitate the two agencies' determination of jurisdiction boundaries of the portion of the Santa Clara River and its tributaries located within the Newhall Ranch project area. This Draft Package will be formally submitted to both the Corps and CDFG with a request for a Jurisdiction Determination from each. This jurisdiction determination will be the basis for both federal and state environmental review and impact assessment under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) respectively, for the Newhall Ranch project in Valencia, California.

This Draft Package for the Newhall Ranch project is organized as follows: Section 1 - Introduction and Background, Section 2 – Jurisdiction Delineation methods, Section 3 Proposed Jurisdiction, and Section 4 - References Cited.

1.1 PROJECT OVERVIEW

The proposed Newhall Ranch project is the construction and maintenance of flood control facilities, storm drains, bridges, roads, building pads, nature trails, and a water reclamation facility. These facilities would supply, in an economically practicable manner, a portion of the infrastructure required over the next 20 years to build out the approved Newhall Ranch Specific Plan area (Figure 1-1) residential, commercial, industrial, mixed uses, and public facilities.

The various proposed projects would be constructed by Newhall Land or other private or public agencies. The proposed 404 permit and 1603 Master Agreement would also include routine maintenance activities to be carried out by the Los Angeles County Department of Public Works (LACDPW) using the 404 permit and 1603 Master Agreement issued to Newhall Land. Any party utilizing a 404 permit and 1603 Agreement issued to Newhall Land would be bound by the same conditions in the 404 permit and/or the 1603 Agreement.

By seeking a long-term, comprehensive 404 permit and 1603 Master Agreement, Newhall Land can facilitate a well planned and streamlined permit evaluation and decision process by the Corps and CDFG, and can provide an opportunity to design a long-term, regionally-based planning and mitigation program for unavoidable impacts to the affected riverine habitats. The 404 permit and 1603 Master Agreement would allow projects to be implemented under specific regional conditions, thereby avoiding the traditional project-by-project permitting

process, expediting the permitting process for qualified projects, and ensuring consistent biological mitigation. In addition, the permits would provide a long-term, conditional authorization for ongoing and future maintenance activities by LACDPW.

The proposed federal action under consideration consists of the issuance of an individual permit under Section 404(b)(1) of the federal Clean Water Act (CWA) for those activities that would result in the discharge of fill or dredged material into "Waters of the United States." Issuance of a 404(b)(1) permit also requires the Corps to complete an endangered species consultation (pursuant to Section 7 of the federal Endangered Species Act) with the U.S. Fish and Wildlife Service (USFWS). Consultation with the National Marine Fisheries Service (NMFS) may also be required.

The proposed state action would be the execution of a Master Agreement Regarding Proposed Lake or Streambed Alteration (1603 Agreement) under Section 1603 of the California Fish and Game Code for these activities that would alter the "...natural flow or substantially change the bed, channel or bank of any river, stream..." and may substantially adversely affect existing fish and wildlife resources. In addition to executing a Master 1603 Agreement, CDFG is required to issue a determination that incidental take of species listed as threatened or endangered by both the state (pursuant to Fish and Game Code 2080.1) and federal governments has been authorized by USFWS through a Section 7 consultation. Furthermore, CDFG must issue an incidental take permit for all state-only listed species pursuant to Fish and Game Code 2081.1.

1.2 CORPS AND CDFG JURISDICTION CRITERIA

Section 404 of the Clean Water Act (CWA) requires authorization from the Corps for all discharges of dredged or fill material in to waters of the United States, including jurisdictional wetlands. Waters of the United States are defined in the Code of Federal Regulations (33 CFR 328.3), and include all rivers and streams, including ephemeral and intermittent streams. The extent of Corps jurisdiction over non-tidal waters in the absence of adjacent wetlands is defined by the "ordinary high water mark (OHWM)". In 33 CFR Part 329.1, the "Ordinary High Water Mark" is defined as the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, or the presence of litter and debris. In general, the OHWM for a stream is usually determined through an examination of the recent physical evidence of surface flow in the stream channel. This evidence may include, but is not limited to, a clear, natural scour line impressed on the bank, recent bank erosion, destruction of native terrestrial vegetation, and the presence of litter and debris. For many small arid watersheds, the presence of continuous

upland vegetation in the stream channel is a good indicator that it only conveys surface flow during extremely large storm events and, as a result, would not usually constitute a jurisdictional water of the United States. However, the presence of native riparian species in a dry wash is usually a good indicator that the stream channel usually exhibits surface flow during both small and moderate storm events (USACE 2001).

The CDFG has direct jurisdiction over any activity diverting or obstructing natural flow or modifying the bed, bank, or channel of any river, stream, or lake designated by CDFG in which there is at any time a fish or wildlife resource, or from which these resources derive benefit, under California Fish and Game Code 1601-1603. CDFG asserts jurisdiction over state water bodies and watercourses that exhibit a defined bed and bank. The upward limit of CDFG jurisdiction is generally the top of the bank, which often extends farther outward than does the Corps' CWA jurisdiction. CDFG 1601 and 1603 codes are similar to the federal CWA 404 permit, but the area of jurisdiction is often determined on a case-by-case basis for the location, nature, and extent of disturbance.

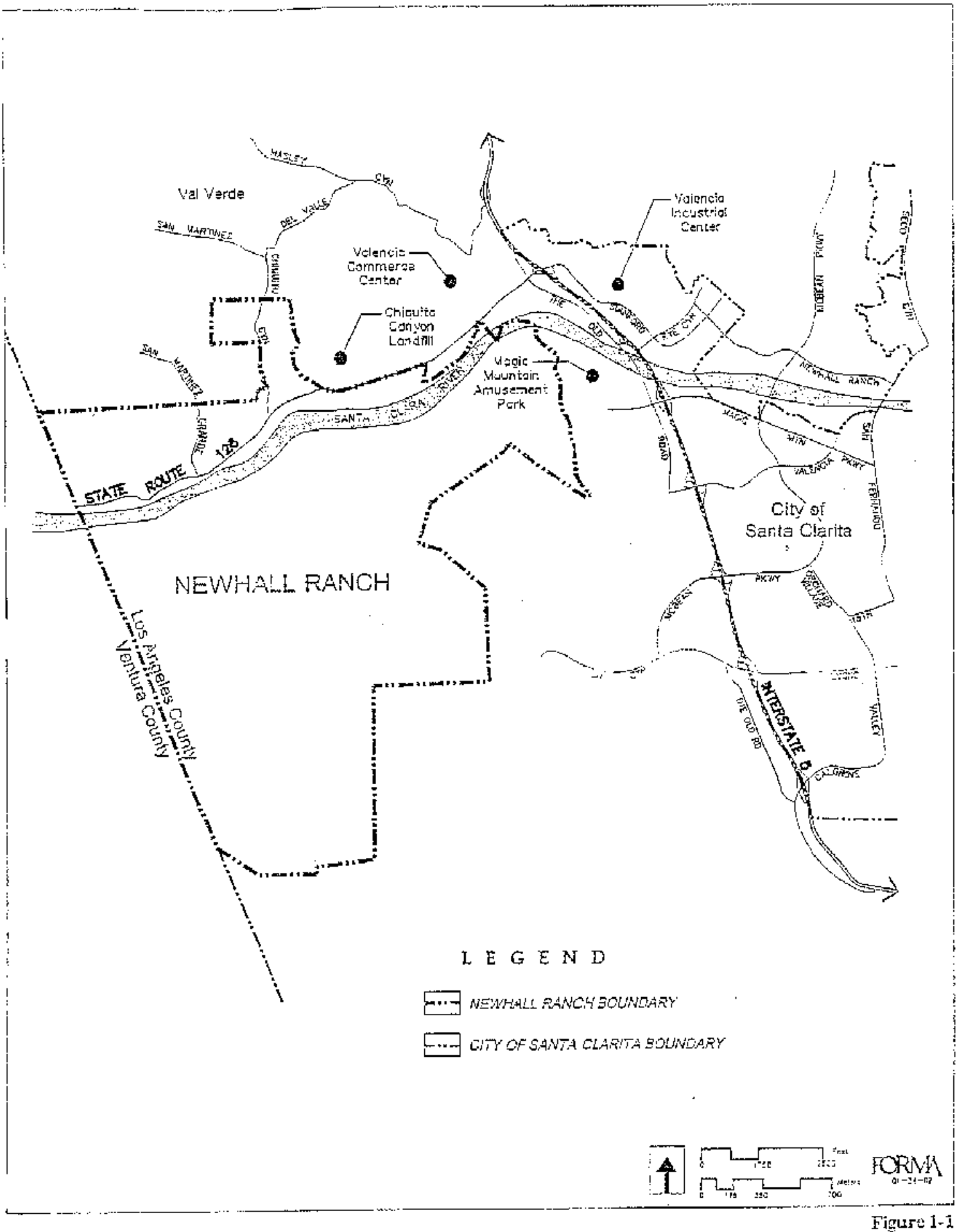

Figure 1-1

SPECIFIC PLAN LOCATION AND BOUNDARIES

SECTION 2.0 JURISDICTION DETERMINATION METHODS

The delineation of jurisdictional boundaries within the Newhall Ranch project area began in 1992 with the Corps' jurisdictional survey of Potrero Canyon (Figure 2-1). This survey determined the extent of the watershed that met the criteria for waters of the U.S. under Section 404 of the CWA. The Corps also conducted a survey of the main stem of the Santa Clara River in 1993.

In April of 1994, CDFG prepared an After the Fact Stream Alteration Agreement (No. 5-1001-94) for the portion of the Santa Clara River located within the Newhall Ranch project area (Figure 2-3).

Since 1994, Newhall Land staff has continued to work with the Corps and CDFG to define what the jurisdiction within the project area was per each agency's determination criteria. However, in 2000 these activities ceased while additional analysis was conducted.

With the Los Angeles County Board of Supervisors' approval of the Newhall Ranch Specific Plan on May 27, 2003, the need to resume jurisdiction determination activities became a priority for the project team. Since then, Newhall Land and Farming and its consultants have met with agency representatives and conducted two day-long field visits to the project area to look at the tributary drainages to reach concurrence and build upon the previous work regarding their jurisdictional status. Additional meetings have been held with the agencies (and are currently scheduled to continue) in an effort to complete this portion of the permitting process. This document contains the results of those activities and serves as a tool to complete the jurisdictional determination process.

2.1 METHODS

Newhall Land and Farming has employed a variety of methods during this process to delineate the watersheds located within the Newhall Ranch project boundary, including analysis of historic data, incorporation of previous jurisdictional determinations by the Corps and CDFG, aerial photo interpretation in conjunction with topographic data, and geographic information systems (GIS) technology. Field assessments have also been carried out to verify the delineations completed using digital technology, and to gather additional locational data via the use of global positioning systems (GPS) equipment to further refine the jurisdictional area.

This delineation, as shown on the attached figures, reflects a concerted effort to provide a conservative assessment of the Newhall Ranch project area to include all drainages that meet the agencies' criteria for inclusion as jurisdictional This delineation has been prepared in consultation with agency representatives both in the field and via review of previously prepared delineations of the area.

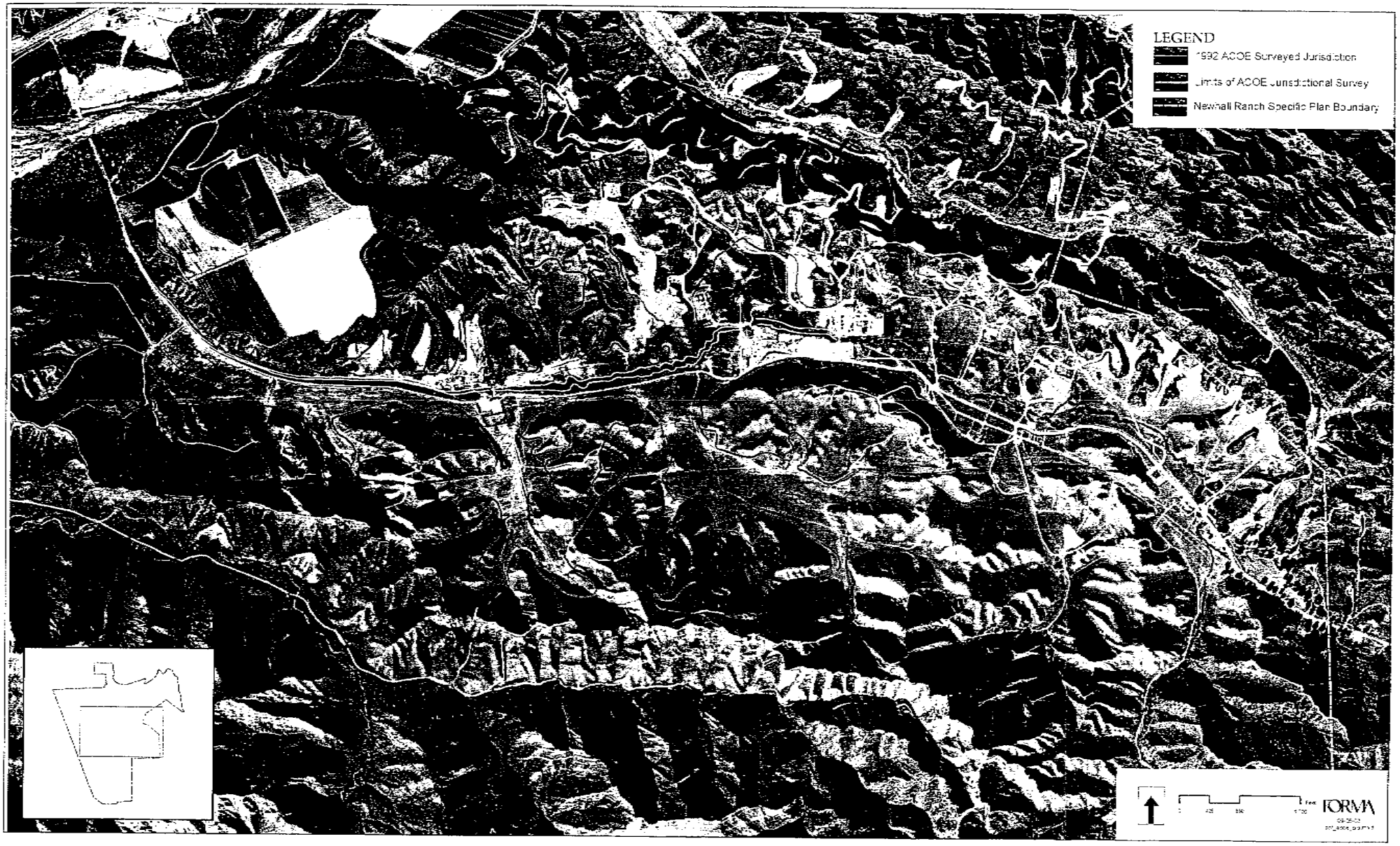

Figure 2-1
POTRERO CANYON
1992 ACOE JURISDICTIONAL SURVEY
NOVEMBER 12, 1992

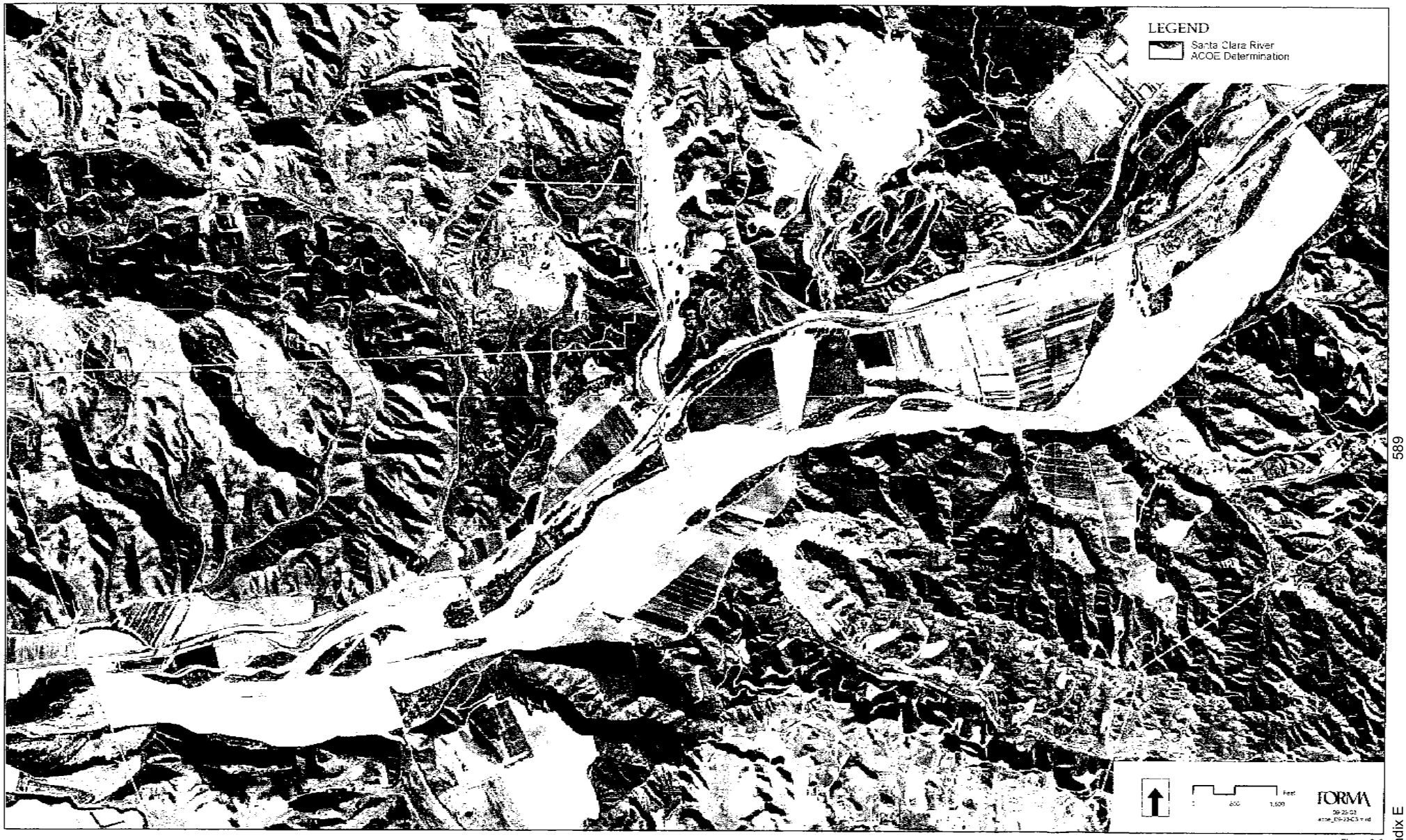

Figure 2-2
SANTA CLARA RIVER
1993 ACOE JURISDICTIONAL DETERMINATION
AUGUST 20, 1993

Figure 2-3
CALIFORNIA DEPARTMENT OF FISH AND GAME
JURISDICTION DELINEATION
APRIL 6, 2003

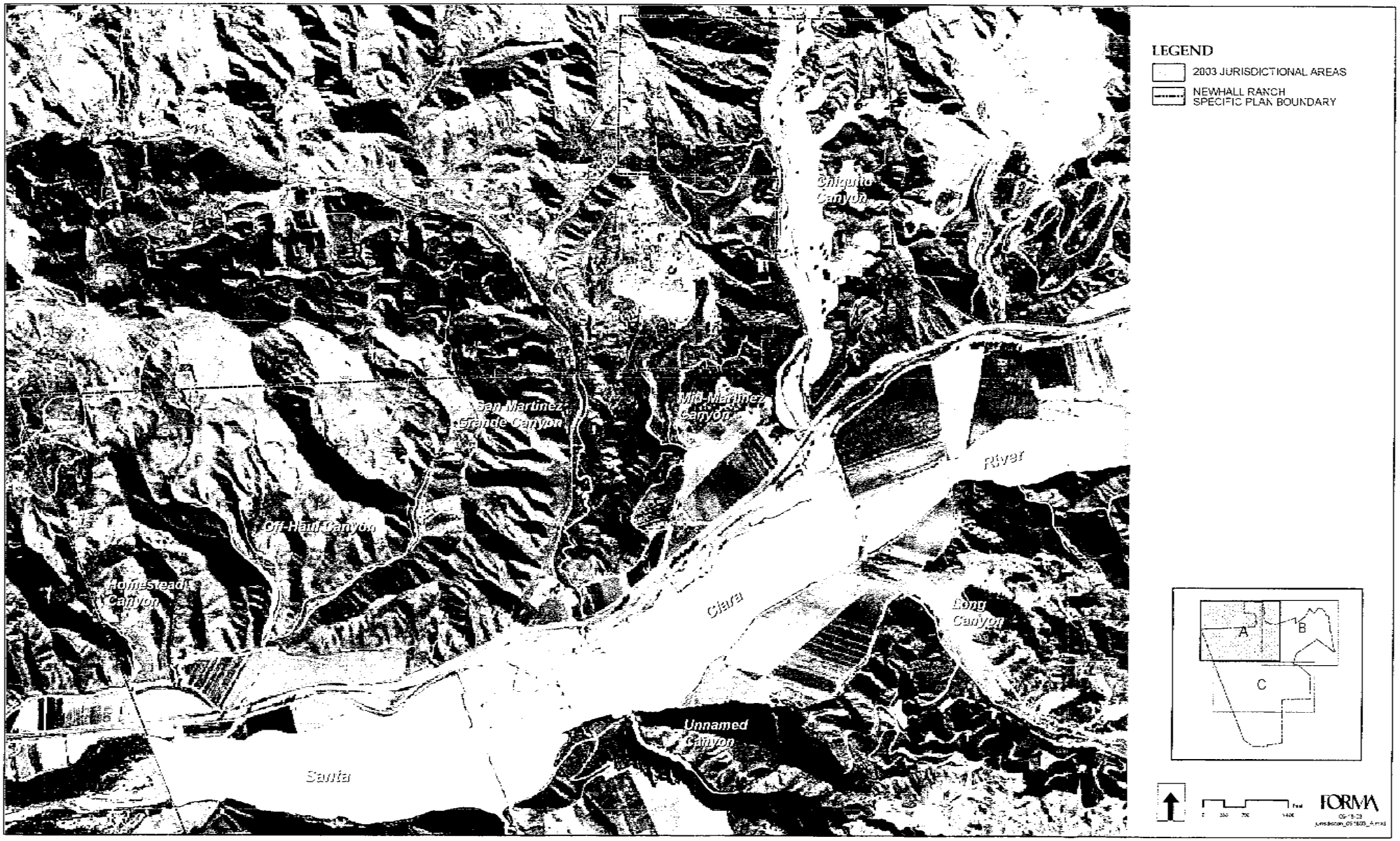

Figure 3-1

JURISDICTIONAL AREAS

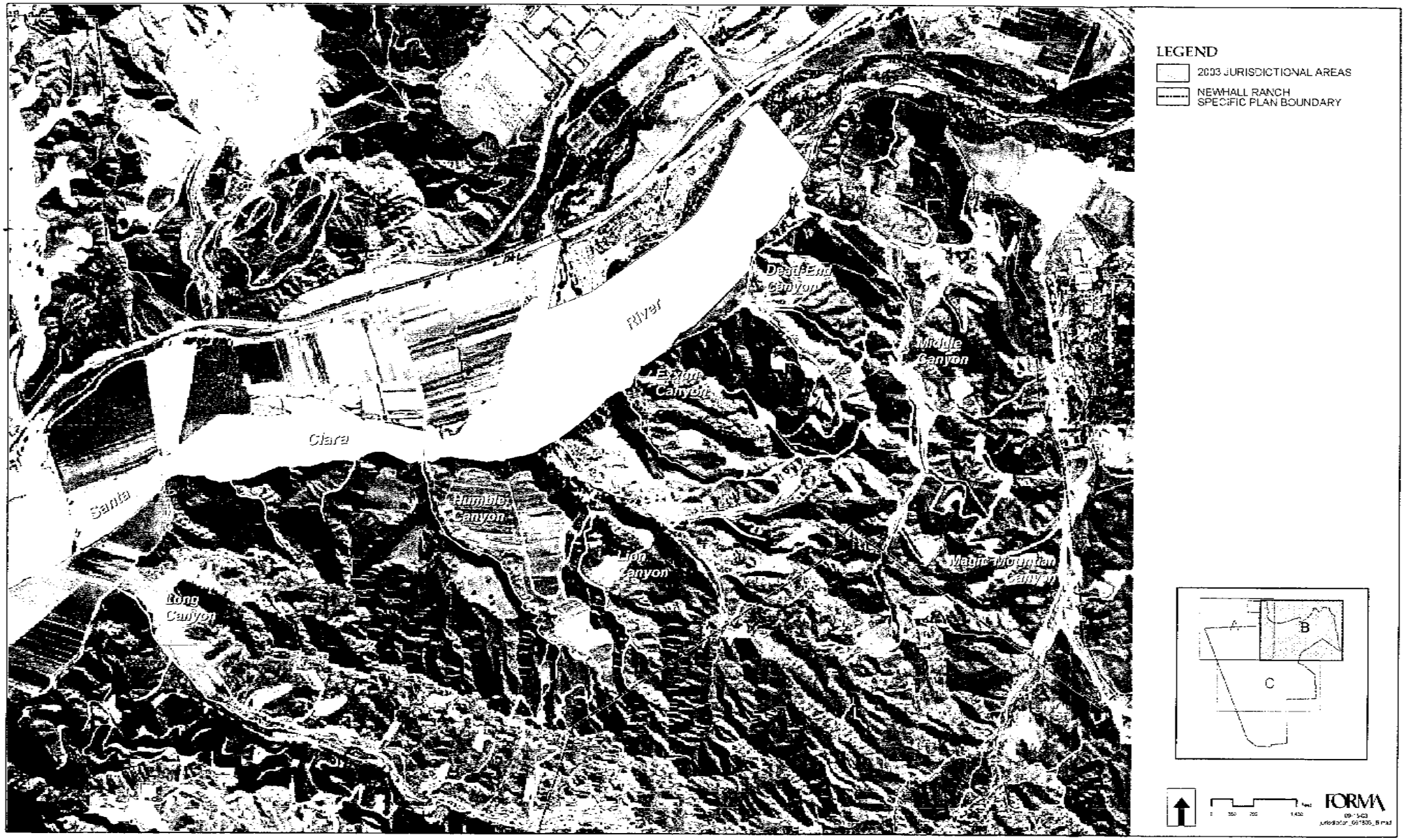

Figure 3-2

JURISDICTIONAL AREAS

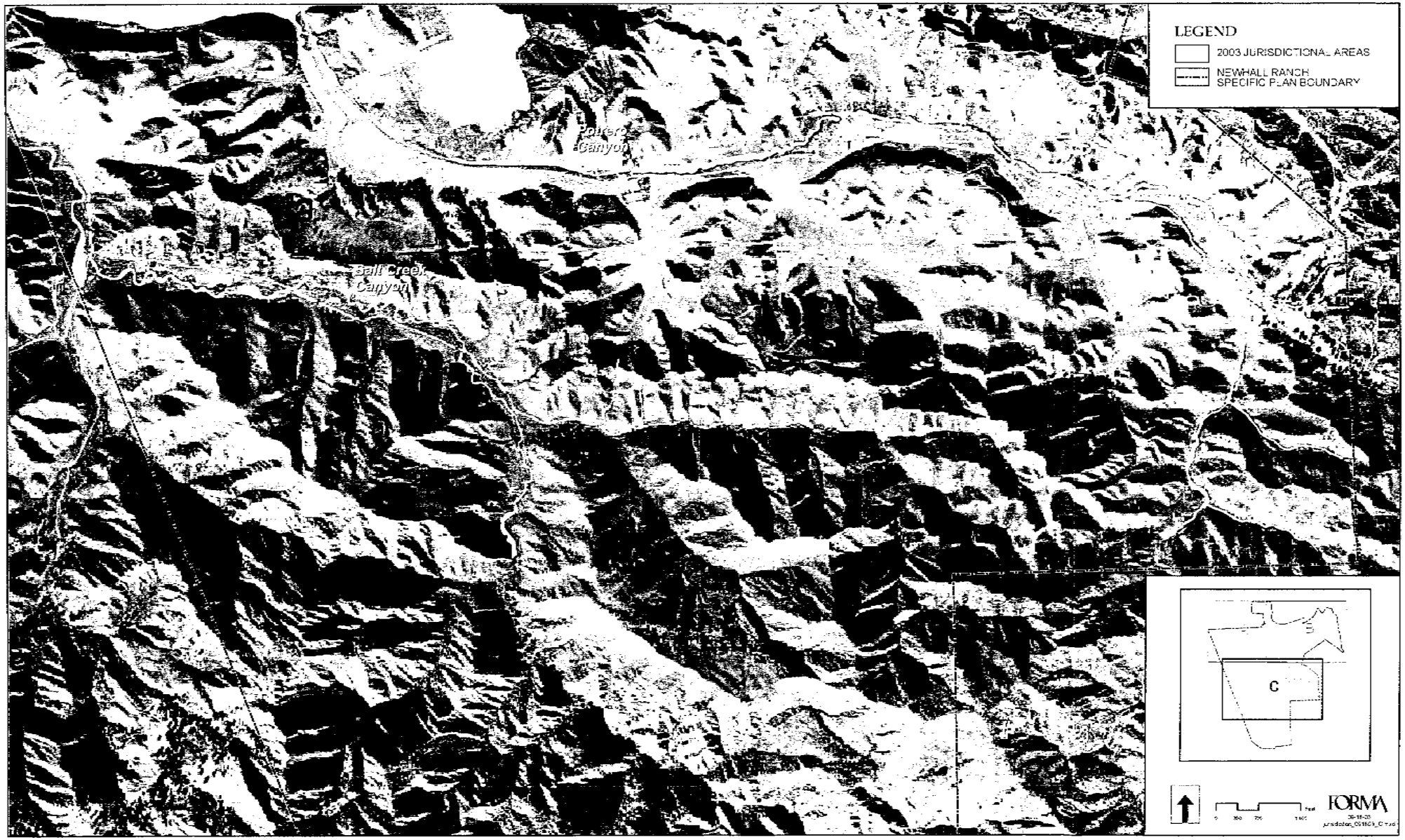

Figure 3-3

JURISDICTIONAL AREAS

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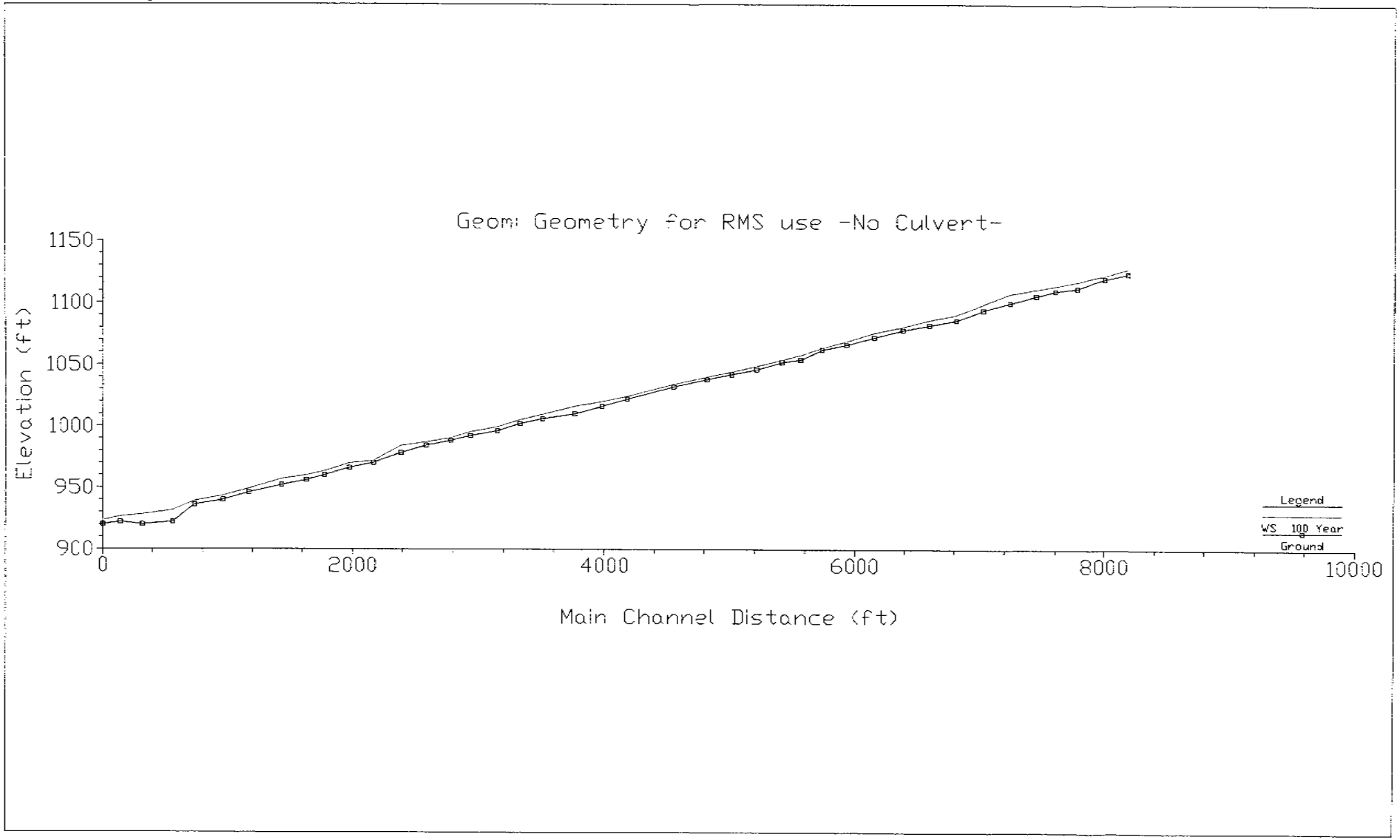

Figure 3-4
STREAM PROFILE SHOWING EXISTING CONDITIONS IN CHIQUITO CANYON

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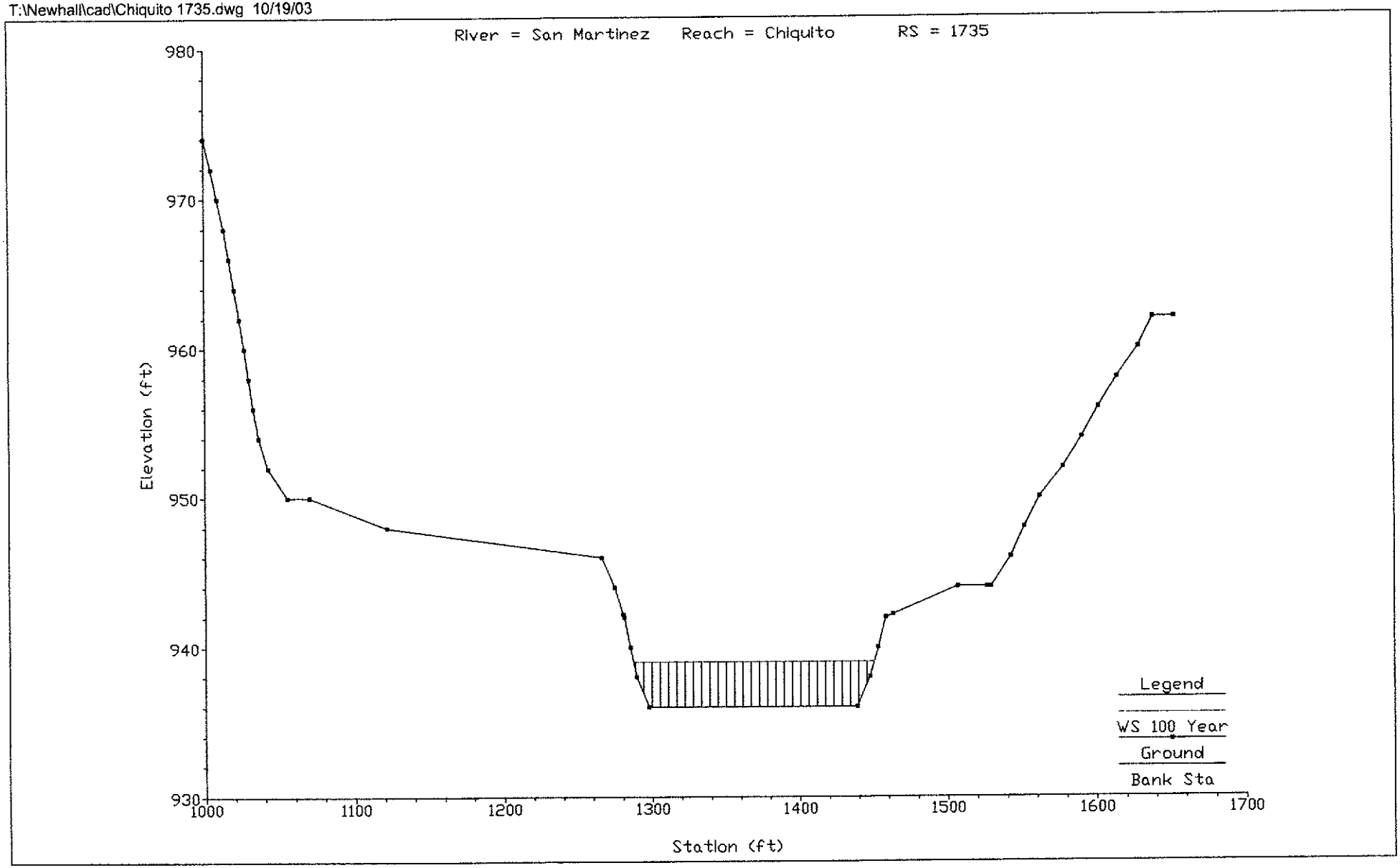

Figure 3-5

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN CHIQUITO CANYON DOWNSTREAM STATION

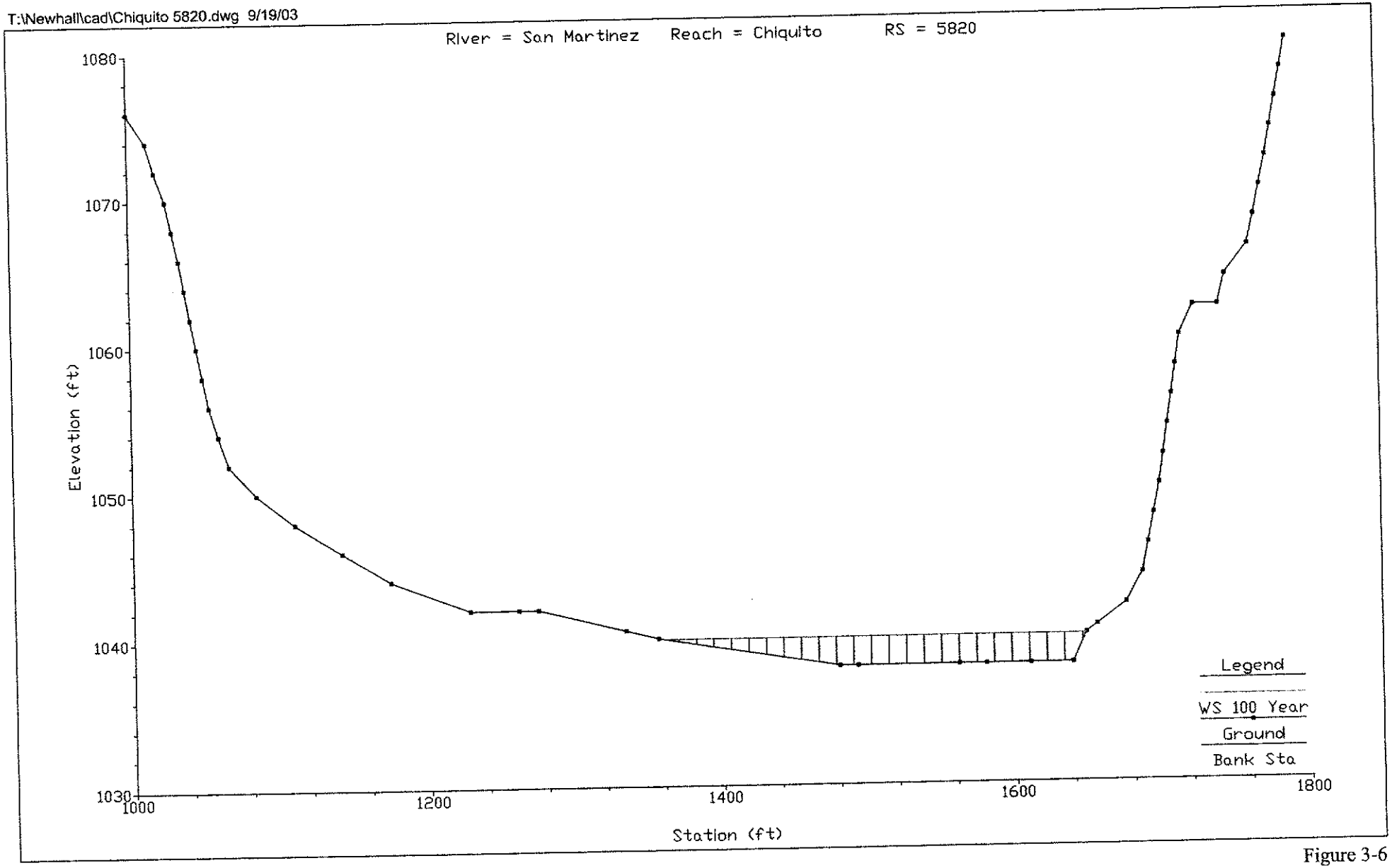

Figure 3-6

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN CHIQUITO CANYON MIDDLE STATION

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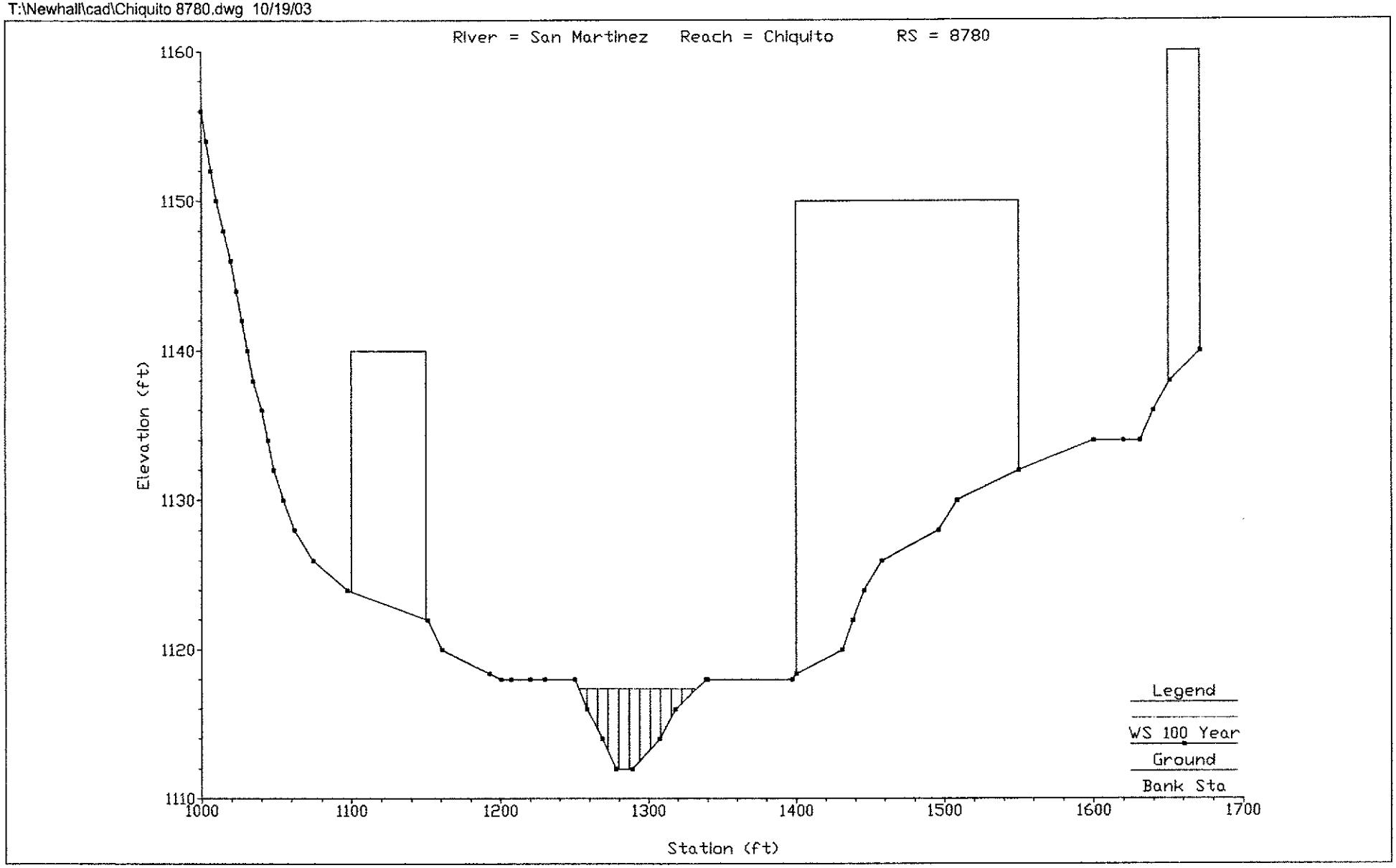

Figure 3-7

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN CHIQUITO CANYON UPSTREAM STATION

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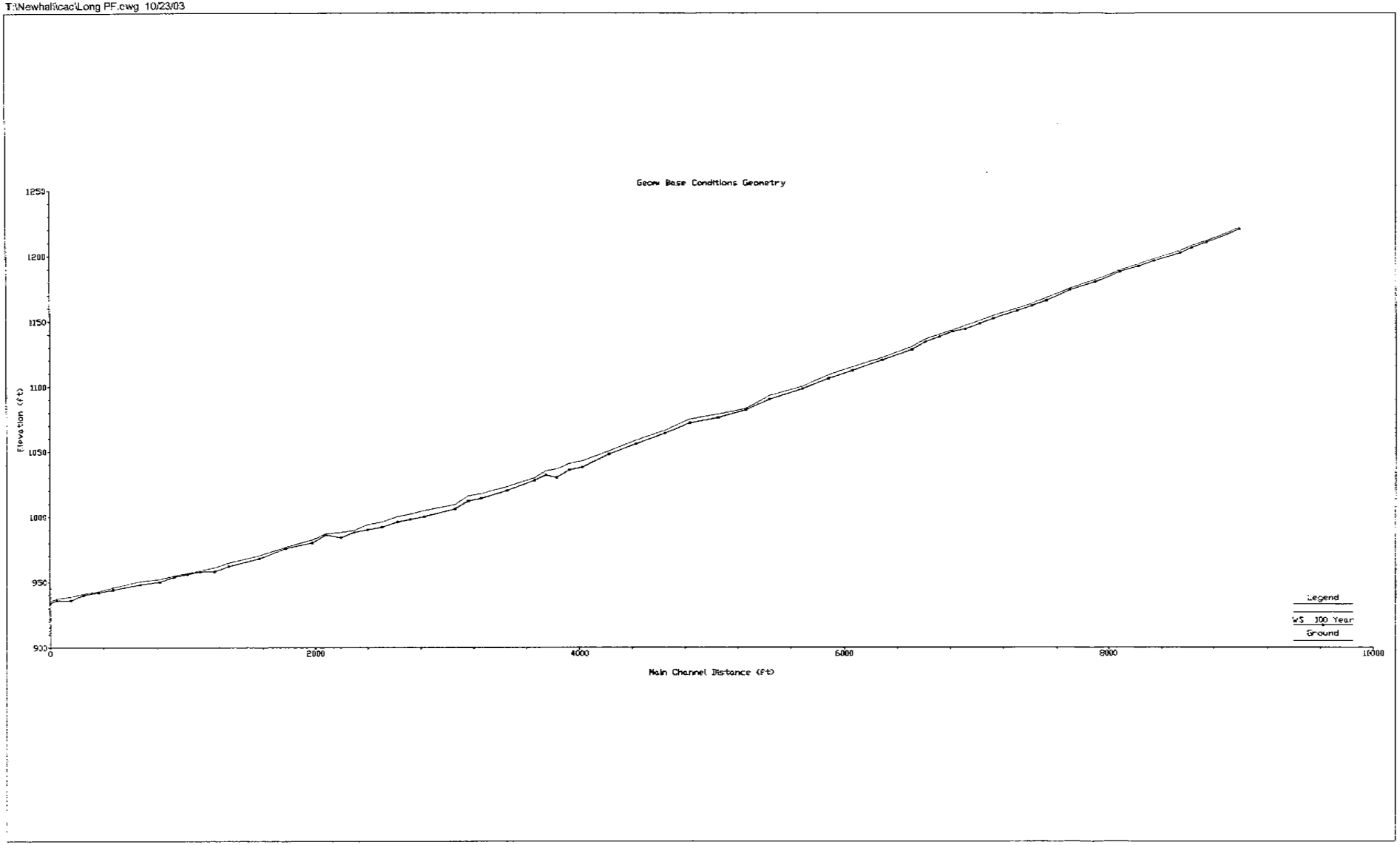

Figure 3-8
STREAM PROFILE SHOWING EXISTING CONDITIONS IN LONG CANYON

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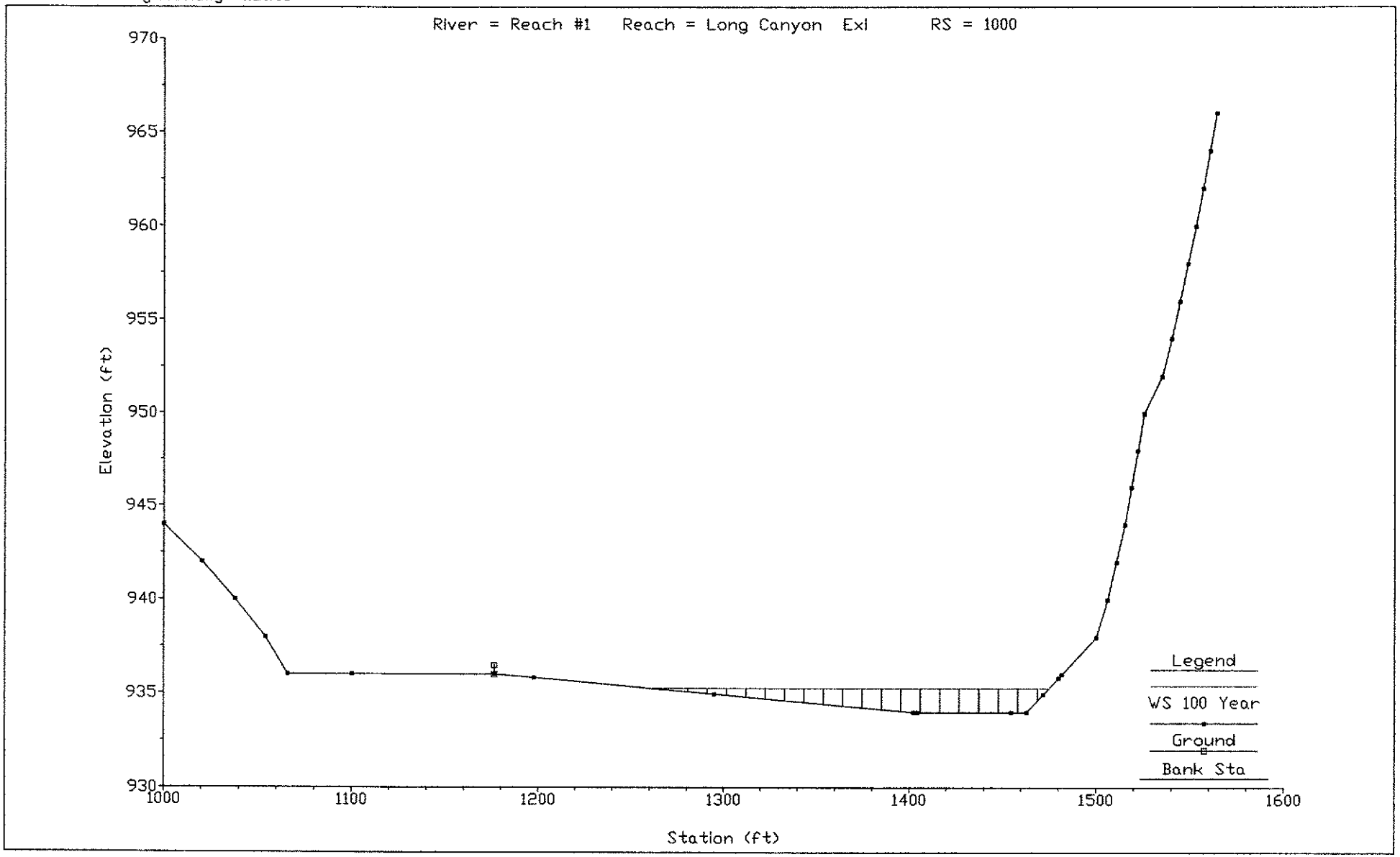

Figure 3-9

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN LONG CANYON DOWNSTREAM STATION

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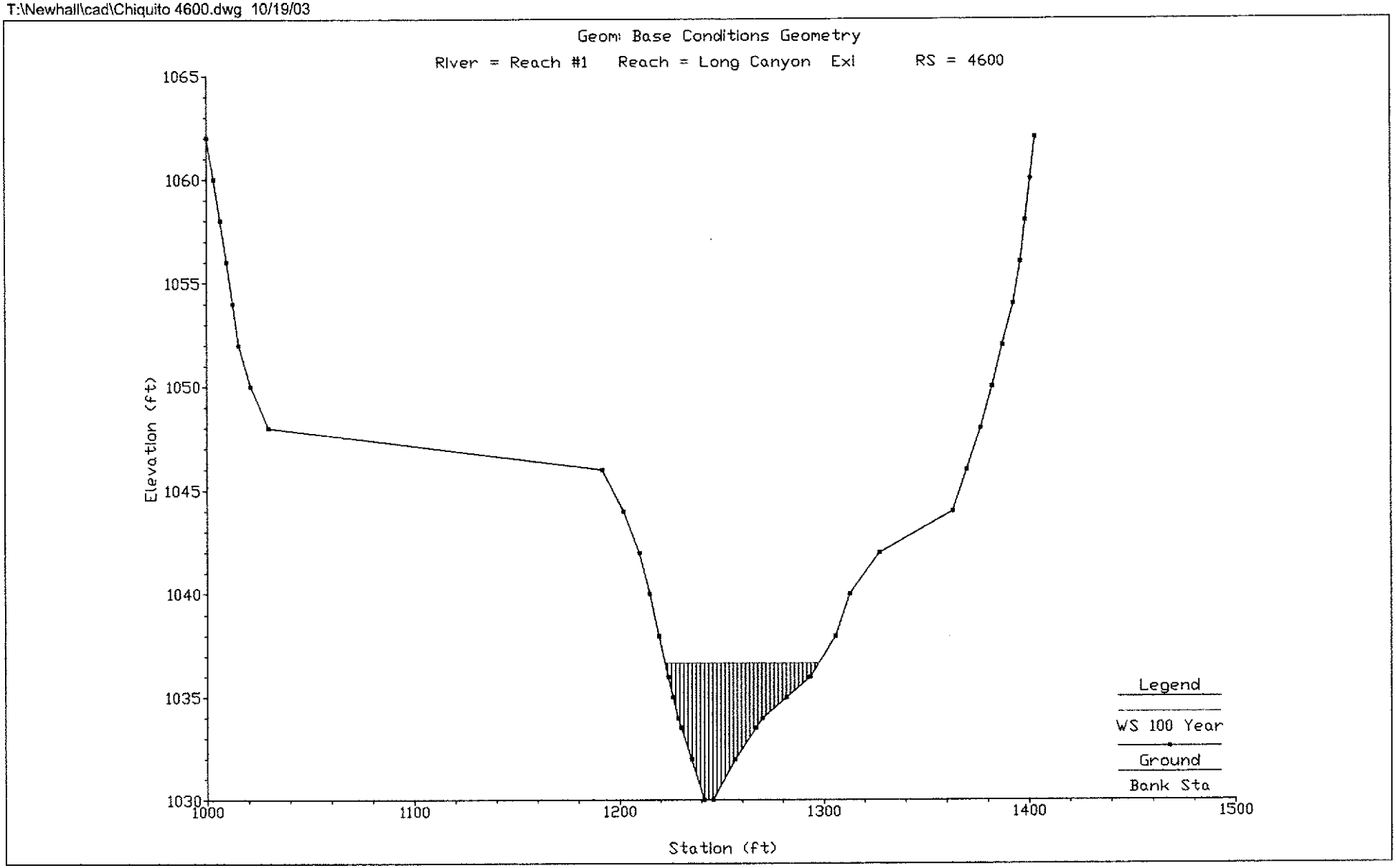

Figure 3-10

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN LONG CANYON MIDDLE STATION

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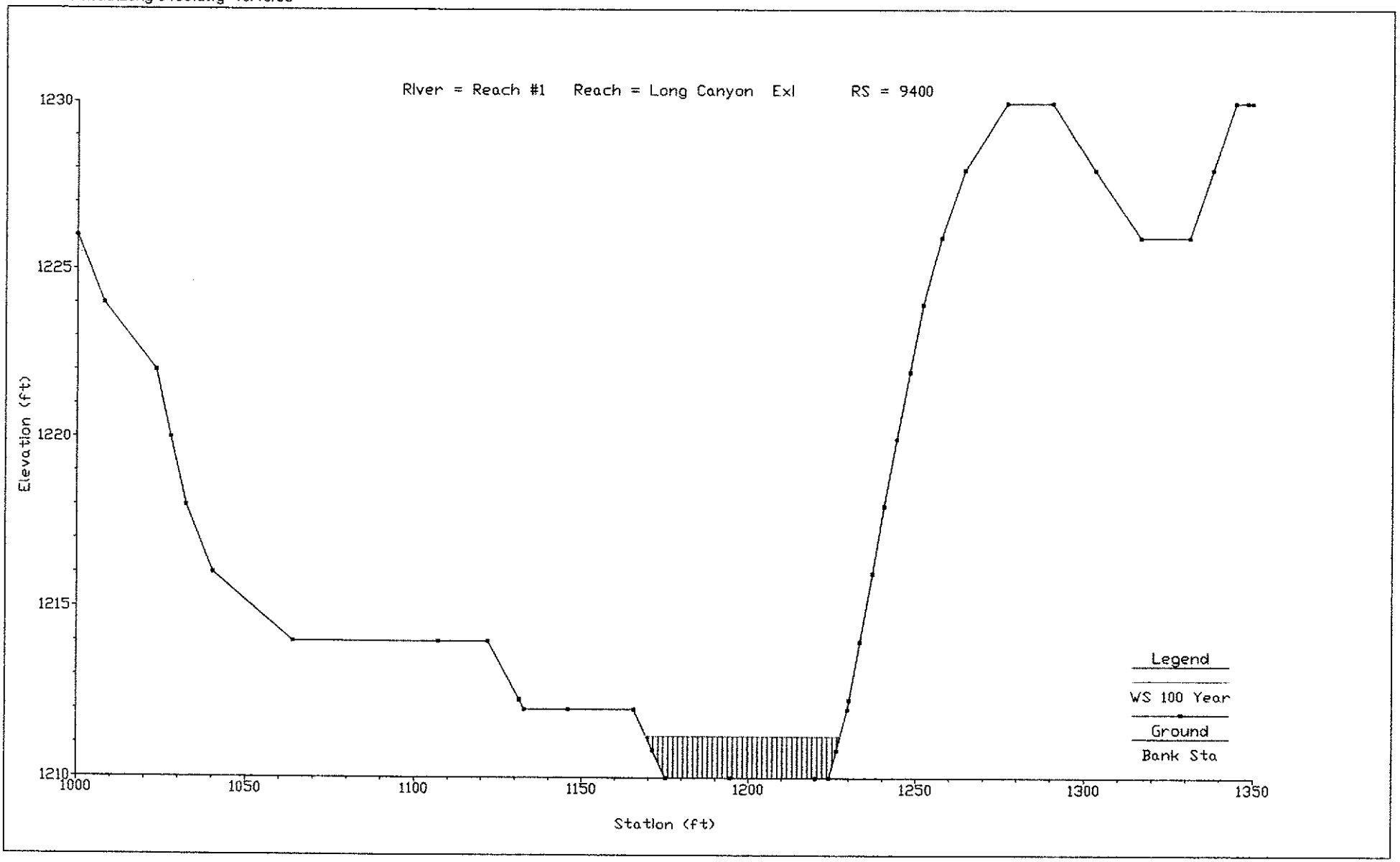

Figure 3-11

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC IN LONG CANYON UPSTREAM STATION

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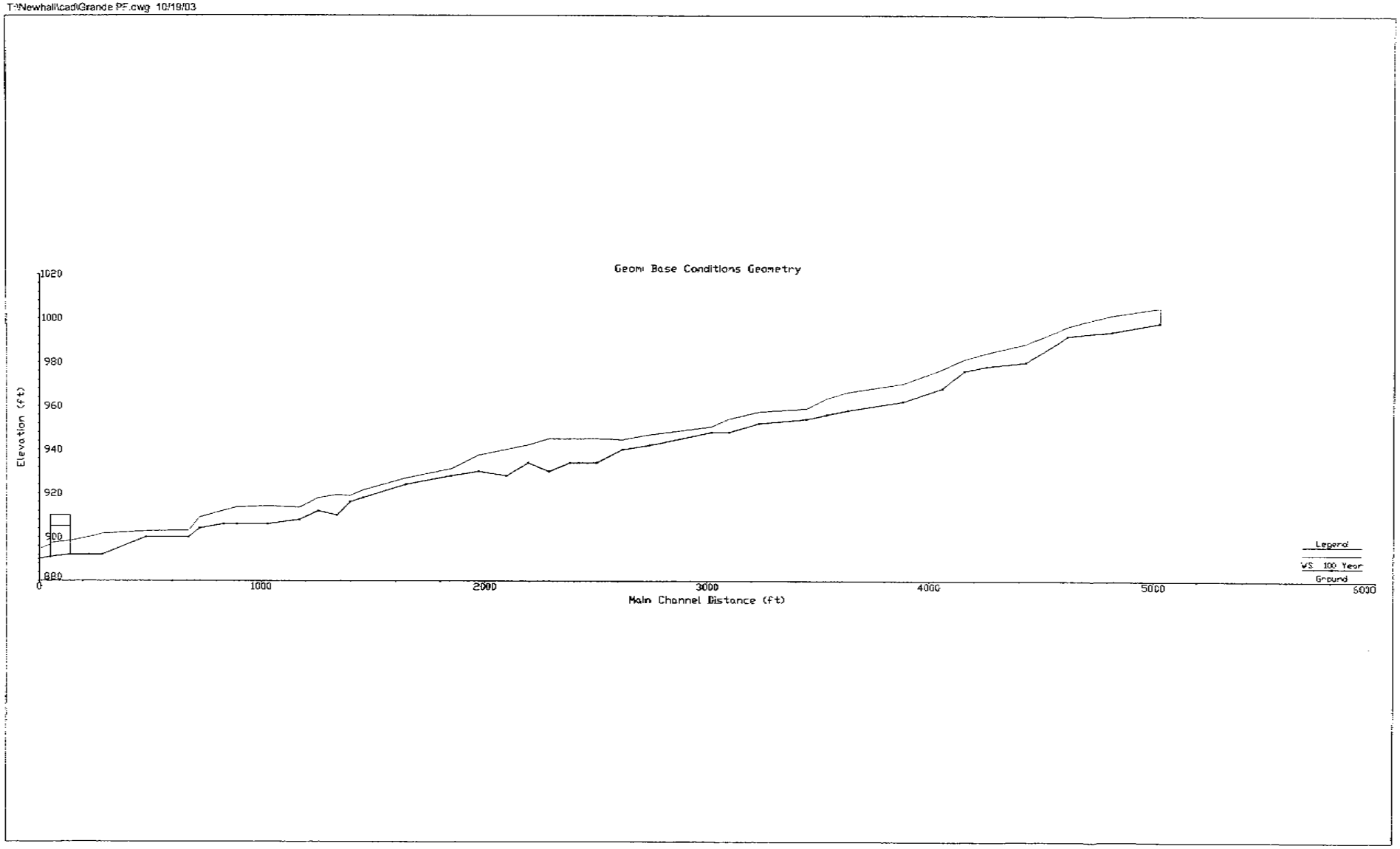

Figure 3-12
STREAM PROFILE SHOWING EXISTING CONDITIONS
IN SAN MARTINEZ GRANDE CANYON

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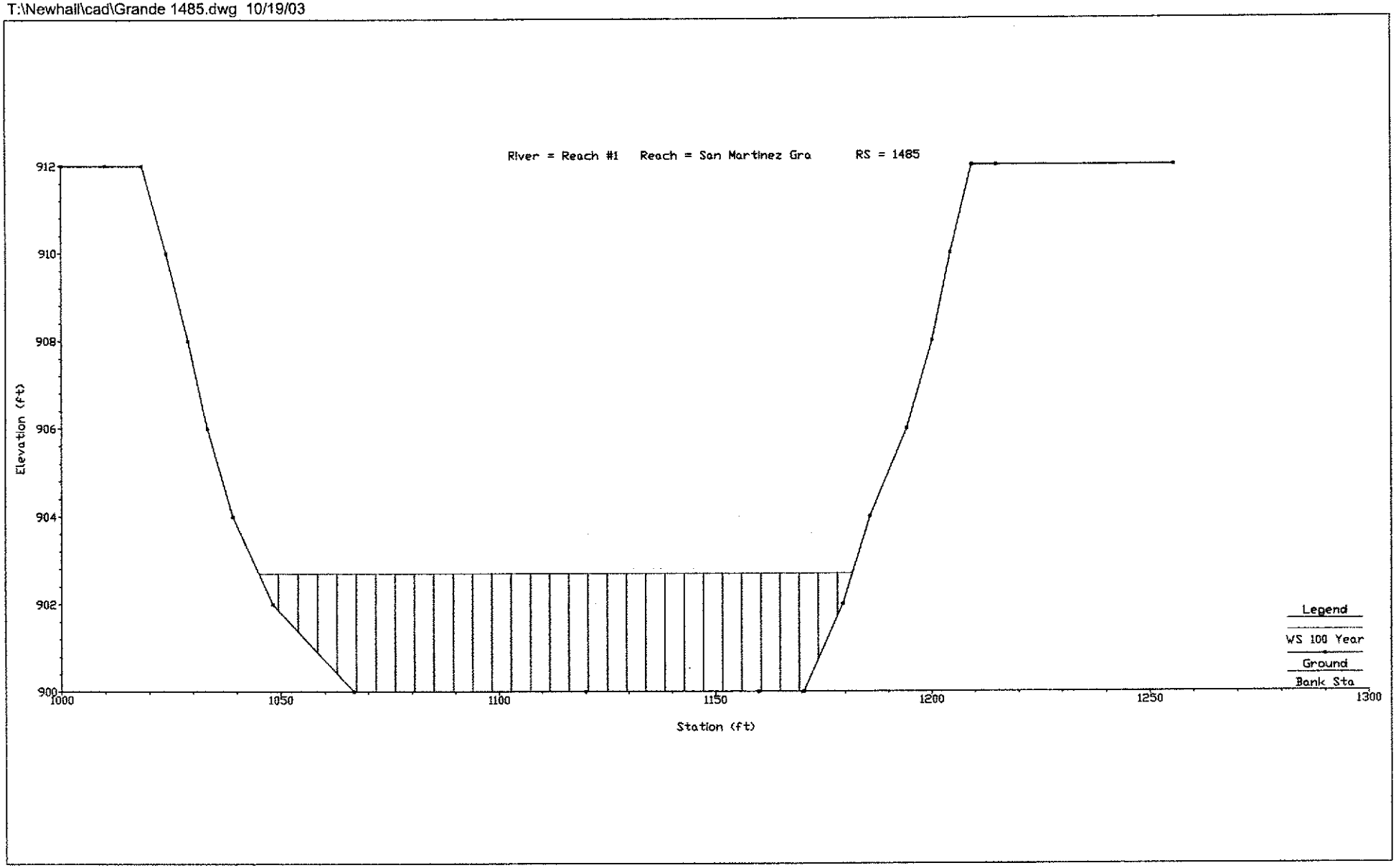

Figure 3-13

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN SAN MARTINEZ GRANDE CANYON DOWNSTREAM STATION

T:\Newhall\cad\Grande 2155.dwg 10/19/03

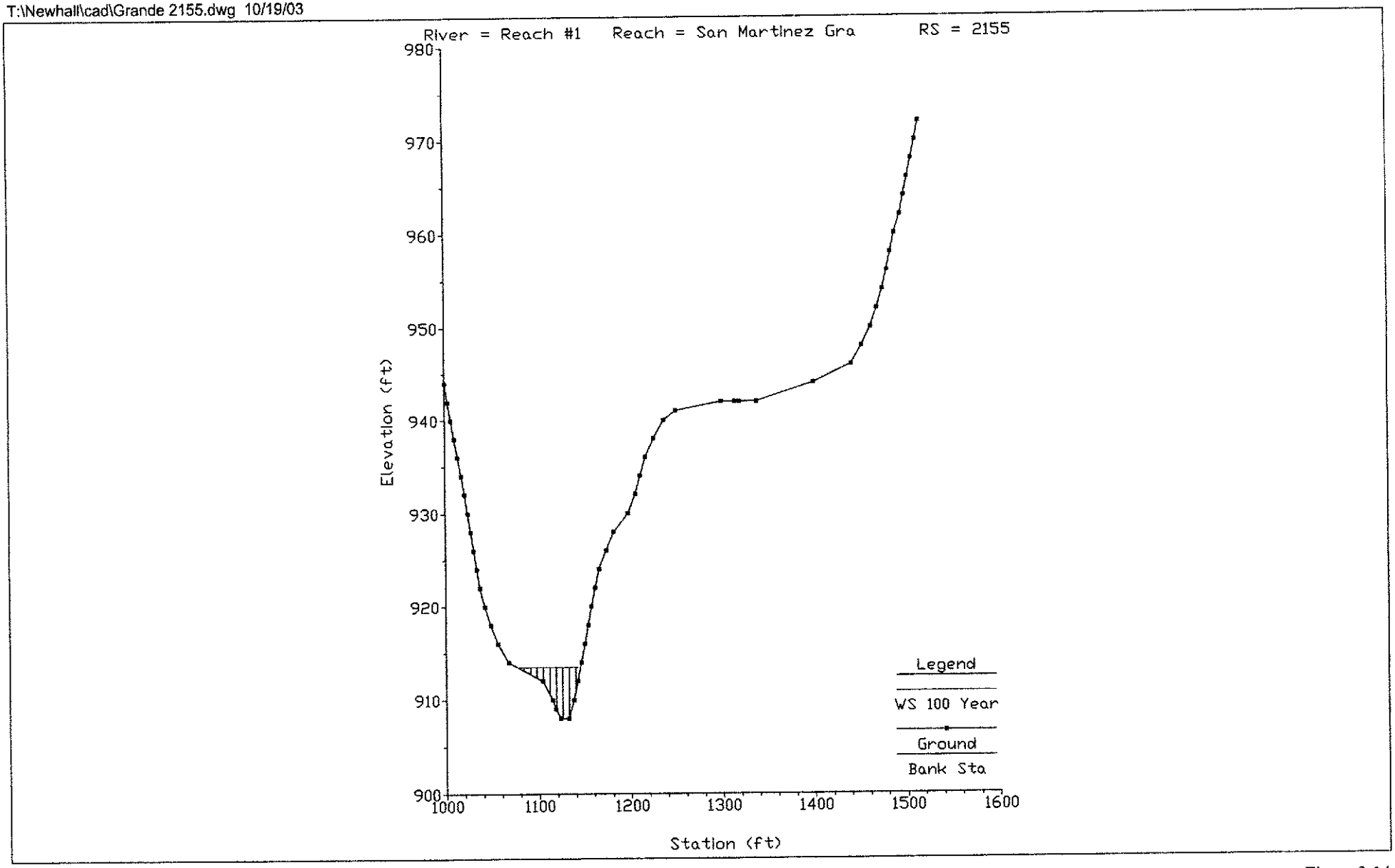

Figure 3-14

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN SAN MARTINEZ GRANDE CANYON MIDSTREAM STATION

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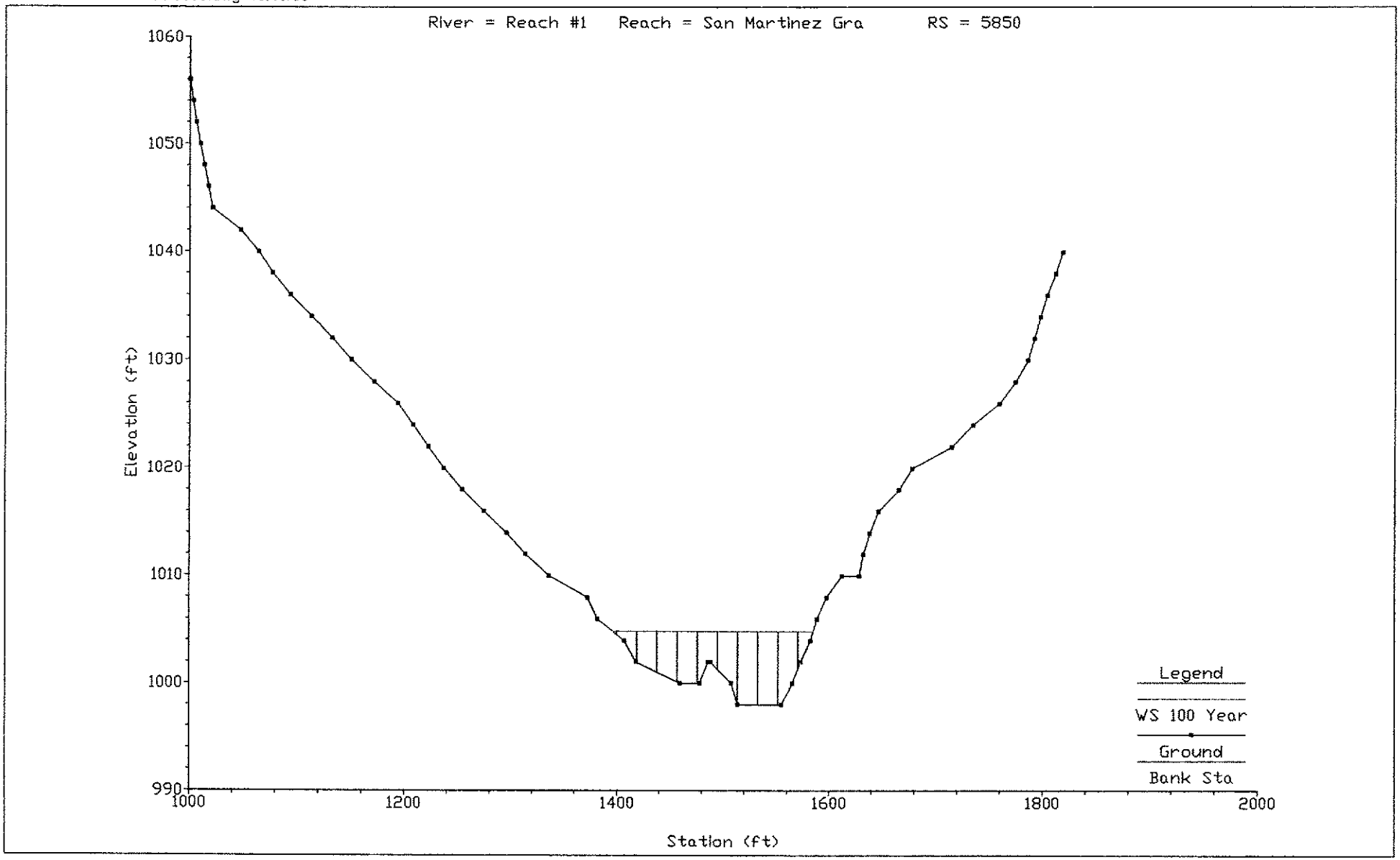

Figure 3-15

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN SAN MARTINEZ GRANDE CANYON UPSTREAM STATION

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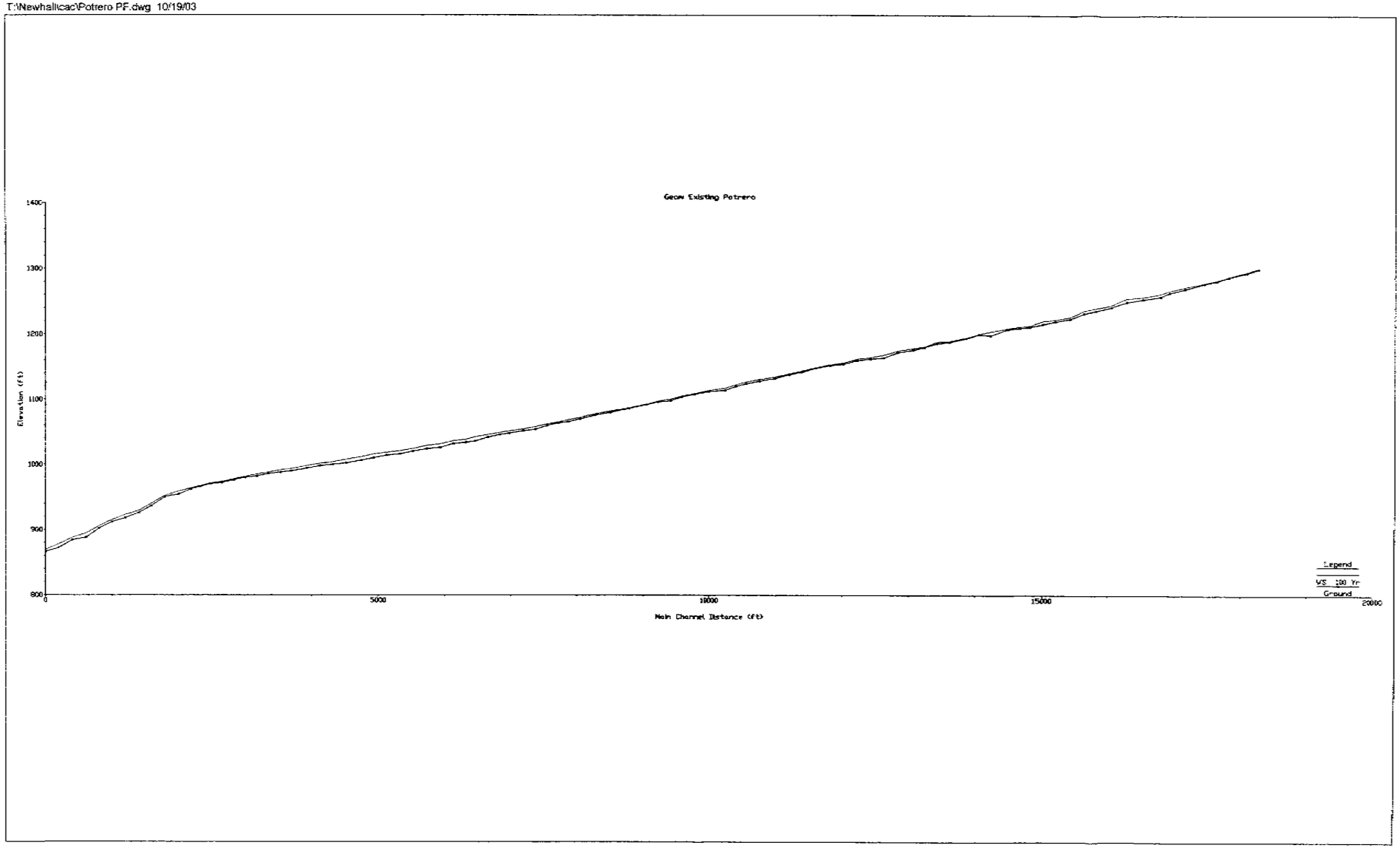

Figure 3-16
STREAM PROFILE SHOWING EXISTING CONDITIONS IN POTRERO CANYON

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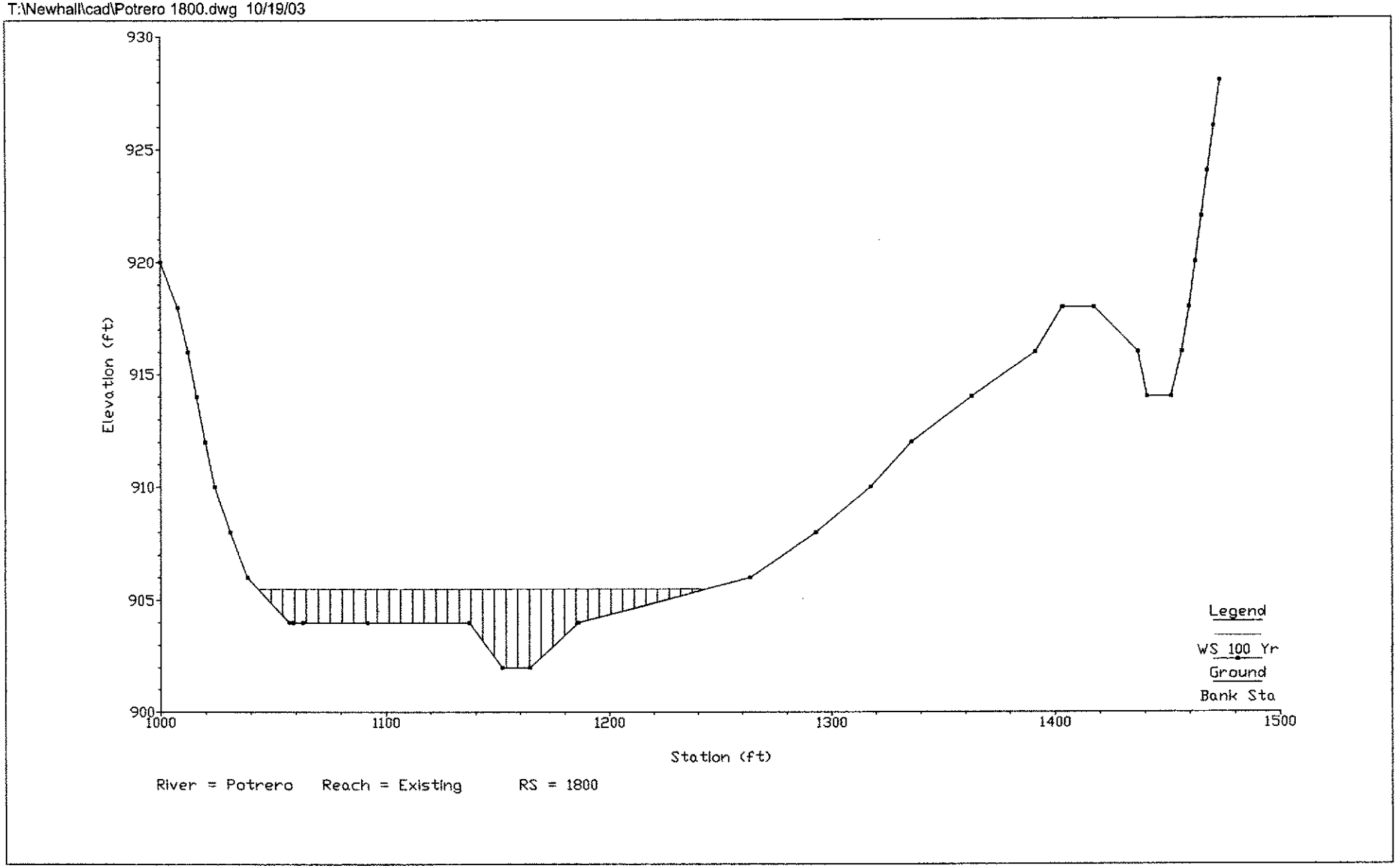

Figure 3-17

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN POTRERO CANYON DOWNSTREAM STATION

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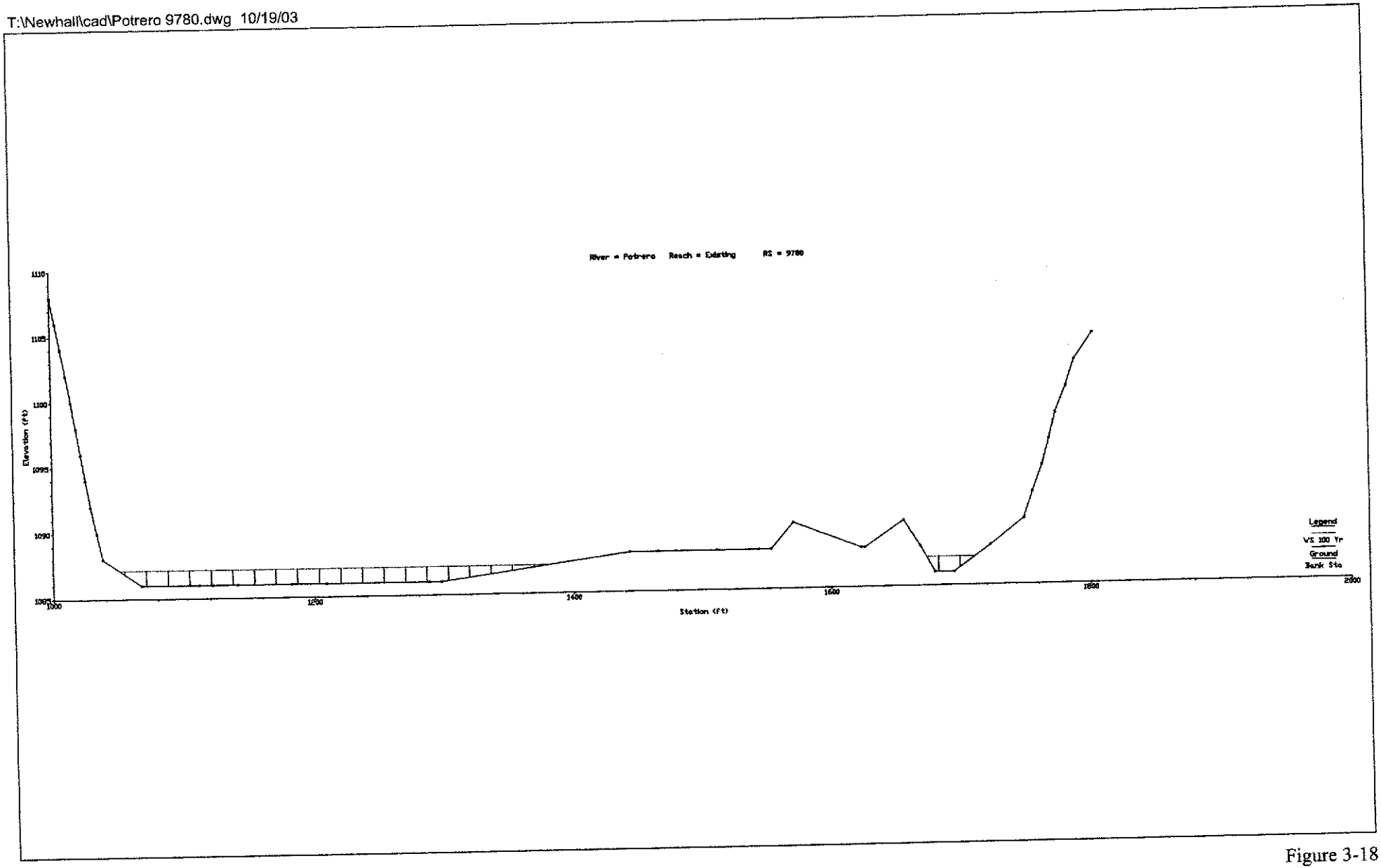

Figure 3-18

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN POTRERO CANYON MIDDLE STATION

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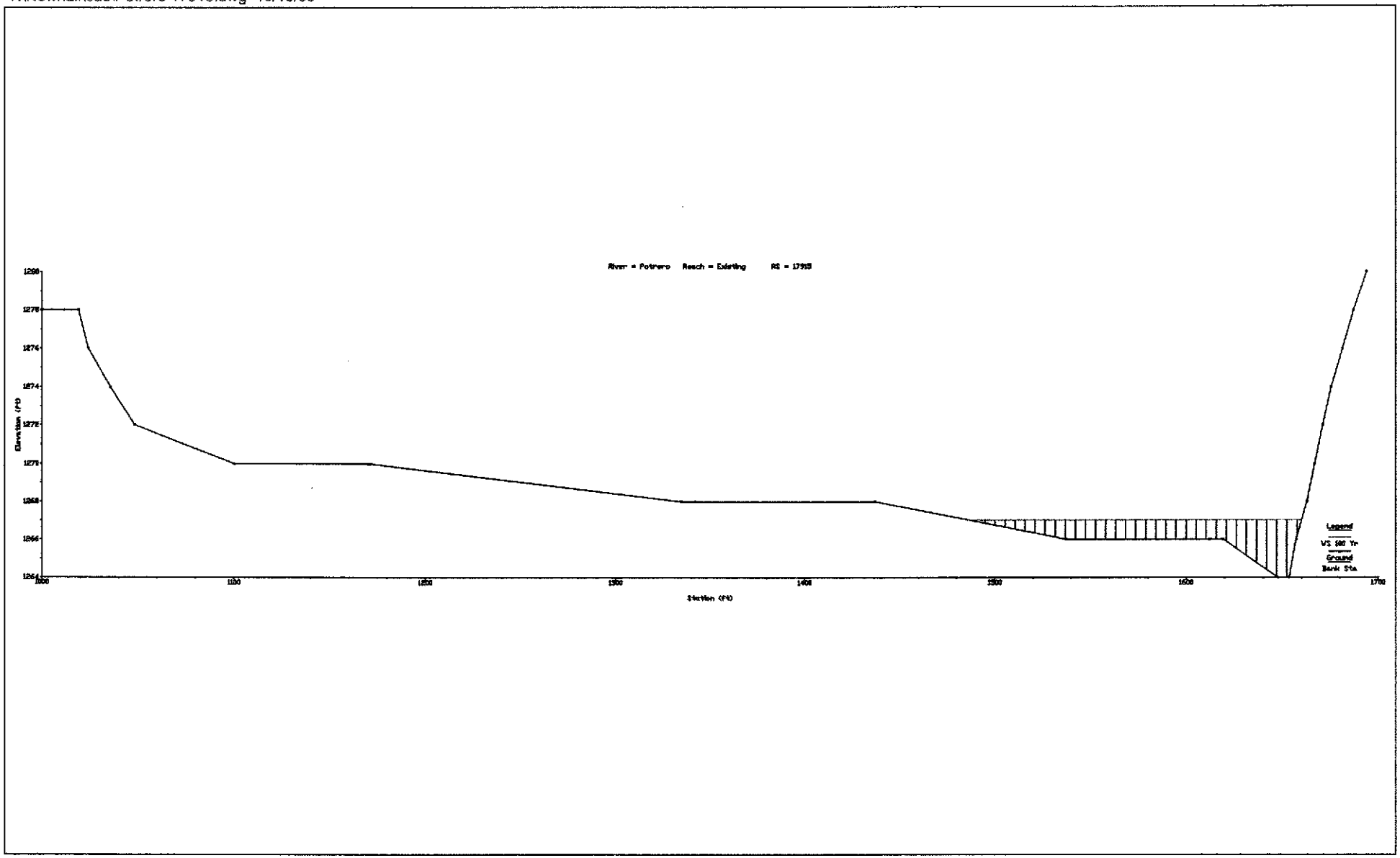

Figure 3-19

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN POTRERO CANYON UPSTREAM STATION

T:\Newhall\cad\Santa Clara River PF.dwg 10/19/03

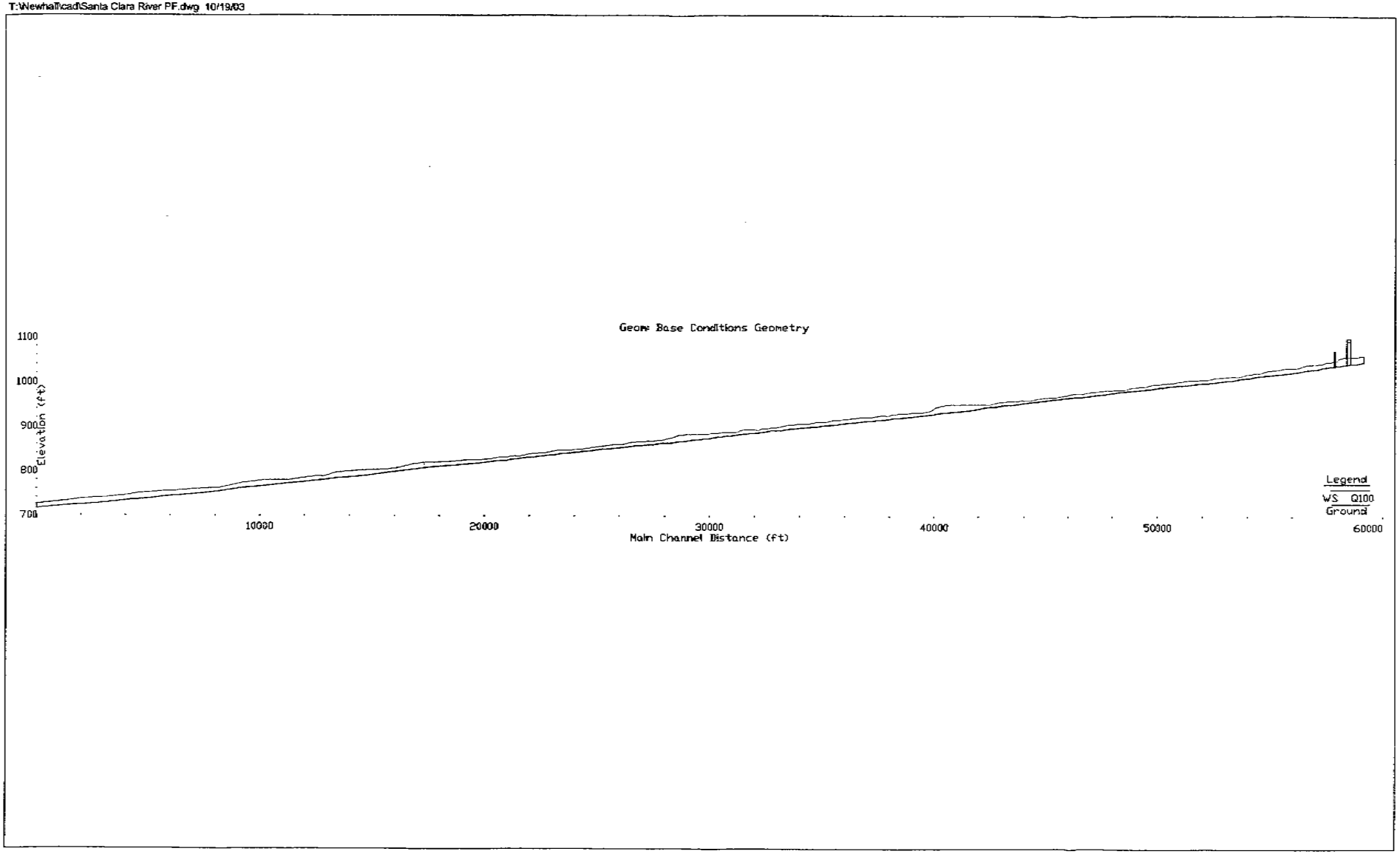

Figure 3-20
STREAM PROFILE SHOWING EXISTING CONDITIONS IN SANTA CLARA RIVER

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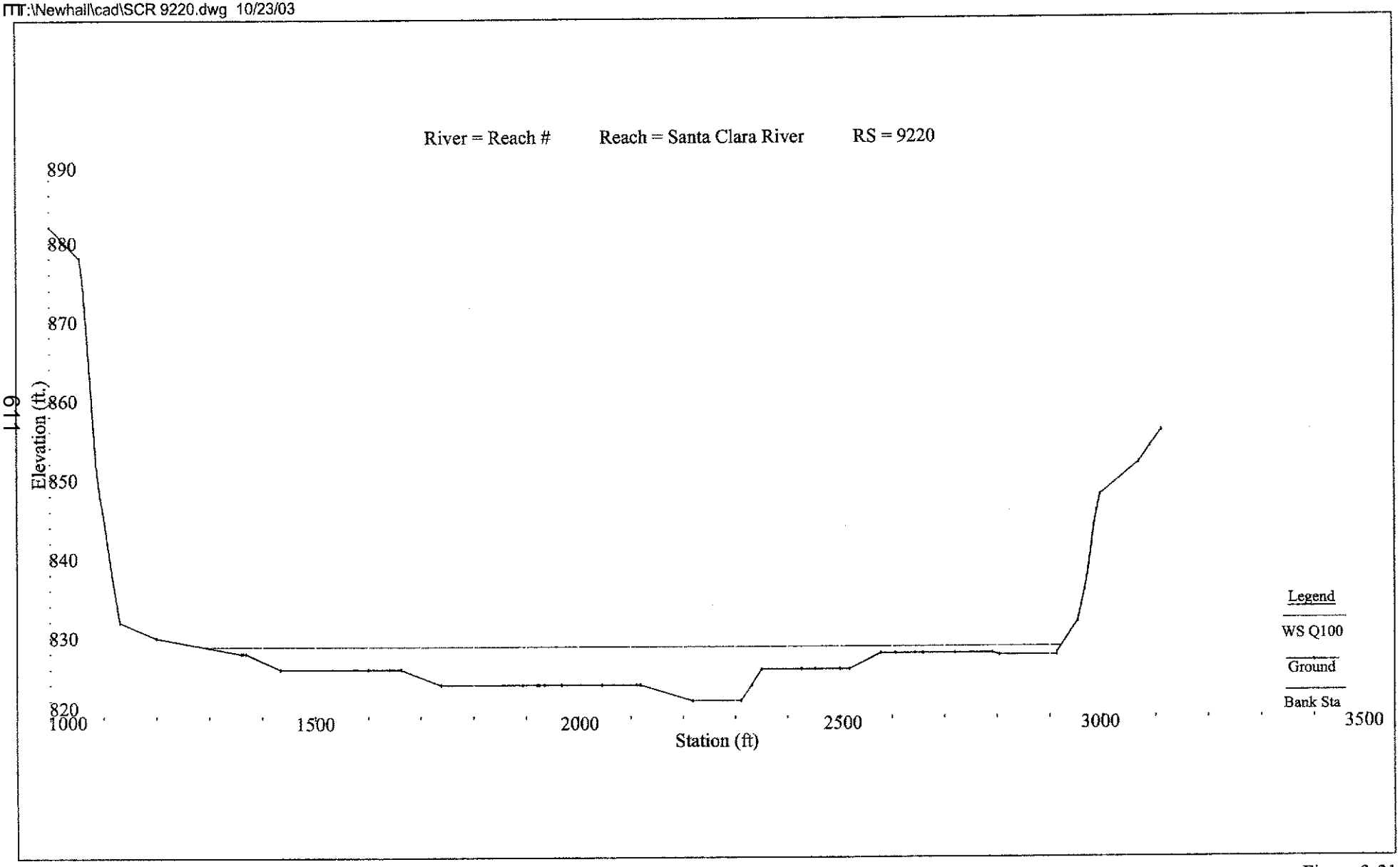

Figure 3-21

SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN SANTA CLARA RIVER CANYON DOWNSTREAM STATION

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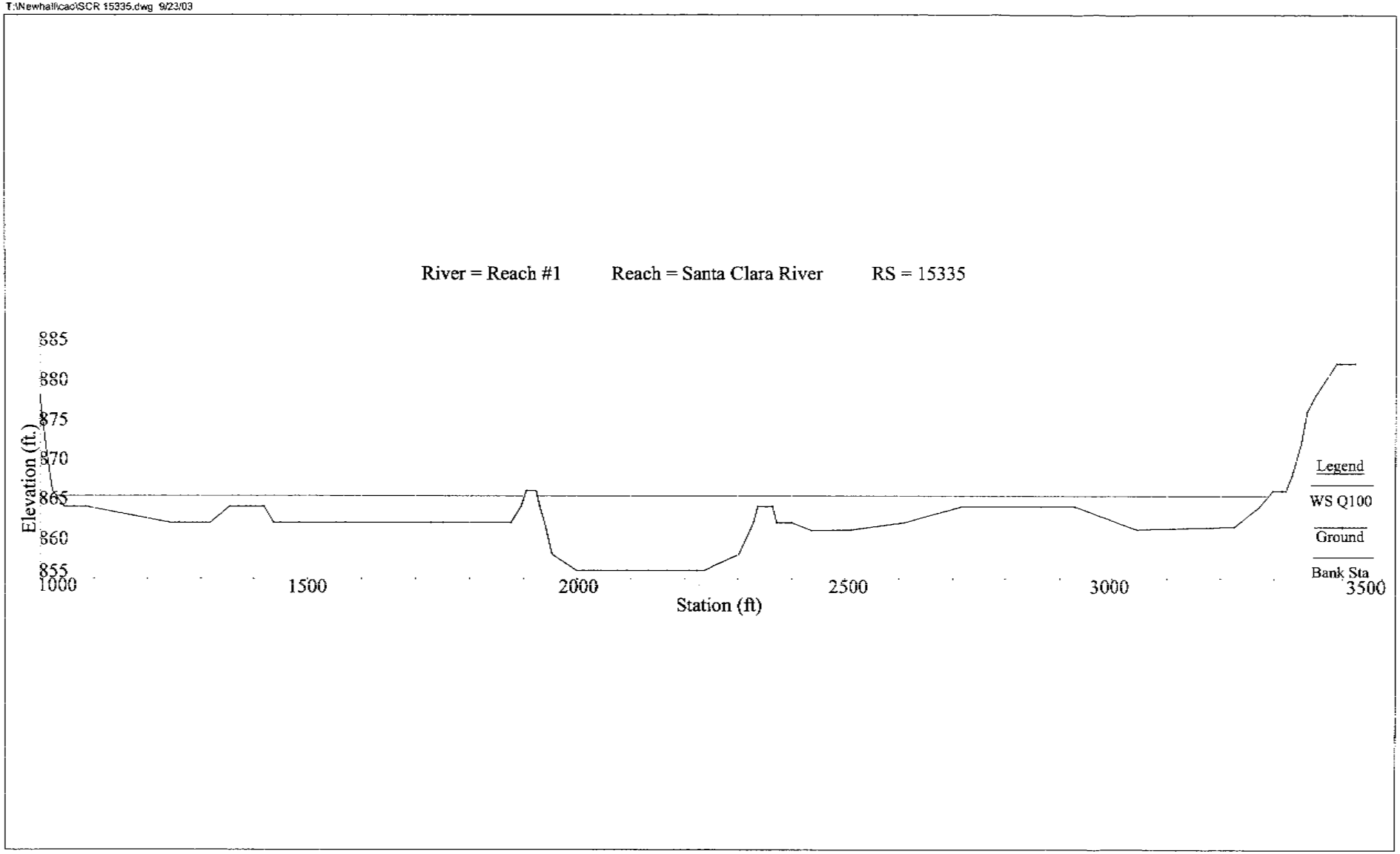

Figure 3-22
SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN SANTA CLARA RIVER CANYON MIDDLE STATION

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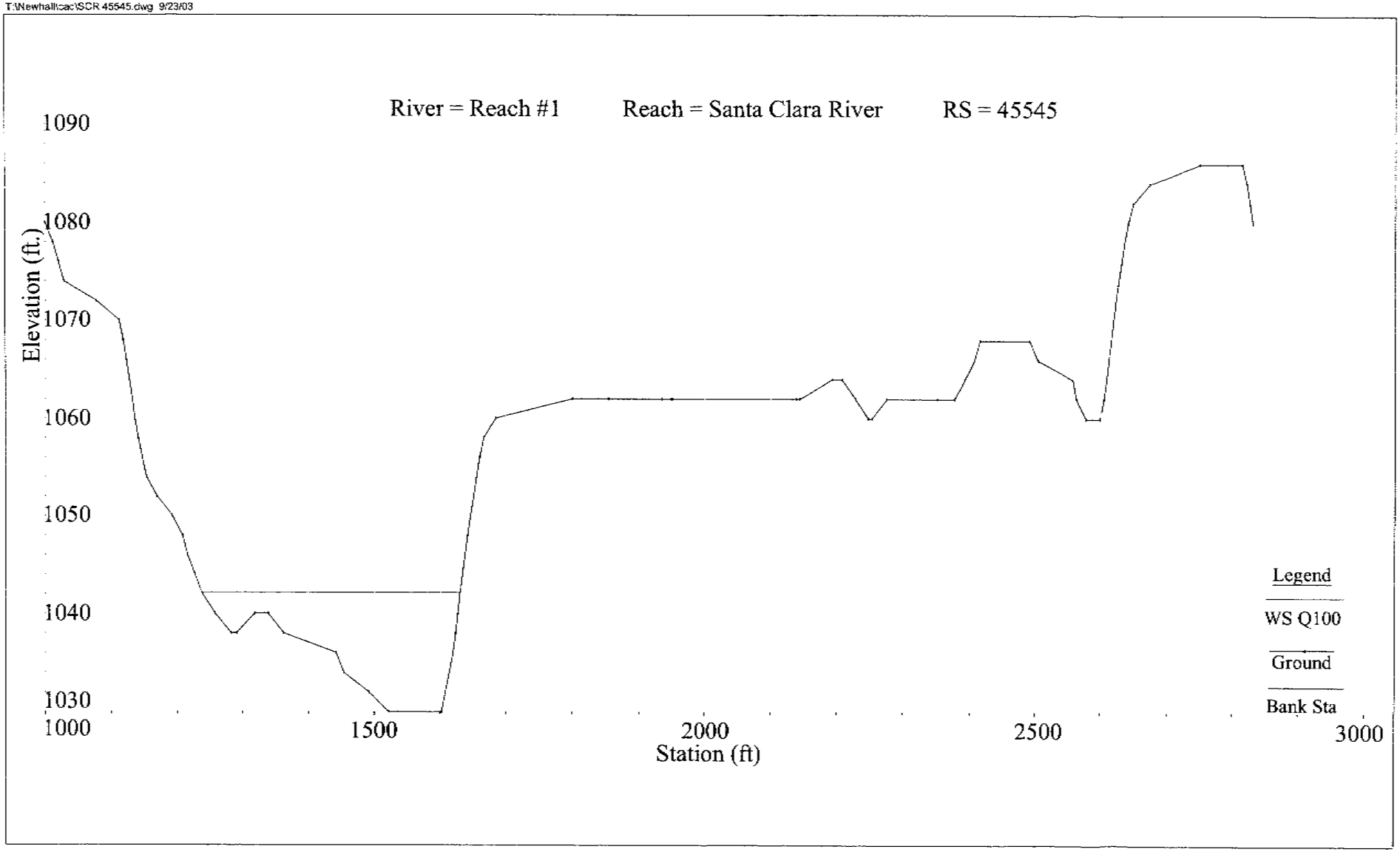

Figure 3-23
SPECIFIC CROSS SECTION SHOWING EXISTING GEOMORPHIC CONDITIONS IN SANTA CLARA RIVER CANYON UPSTREAM STATION

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U.S. Army Corps of Engineers (USACE). 2001. Final Summary Report: Guidelines for Jurisdictional Determinations for Waters of the United States in the Arid Southwest. June 2001.

DUDEK, Sensitive Plant Survey Results

2002 Sensitive Plant Survey Results

for

Newhall Ranch Specific Plan Area
Los Angeles County, California

Prepared for:

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23823 Valencia Boulevard
Valencia, CA 91355
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Prepared by:

DUDEK
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November 20, 2002

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2002 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

1.0 INTRODUCTION

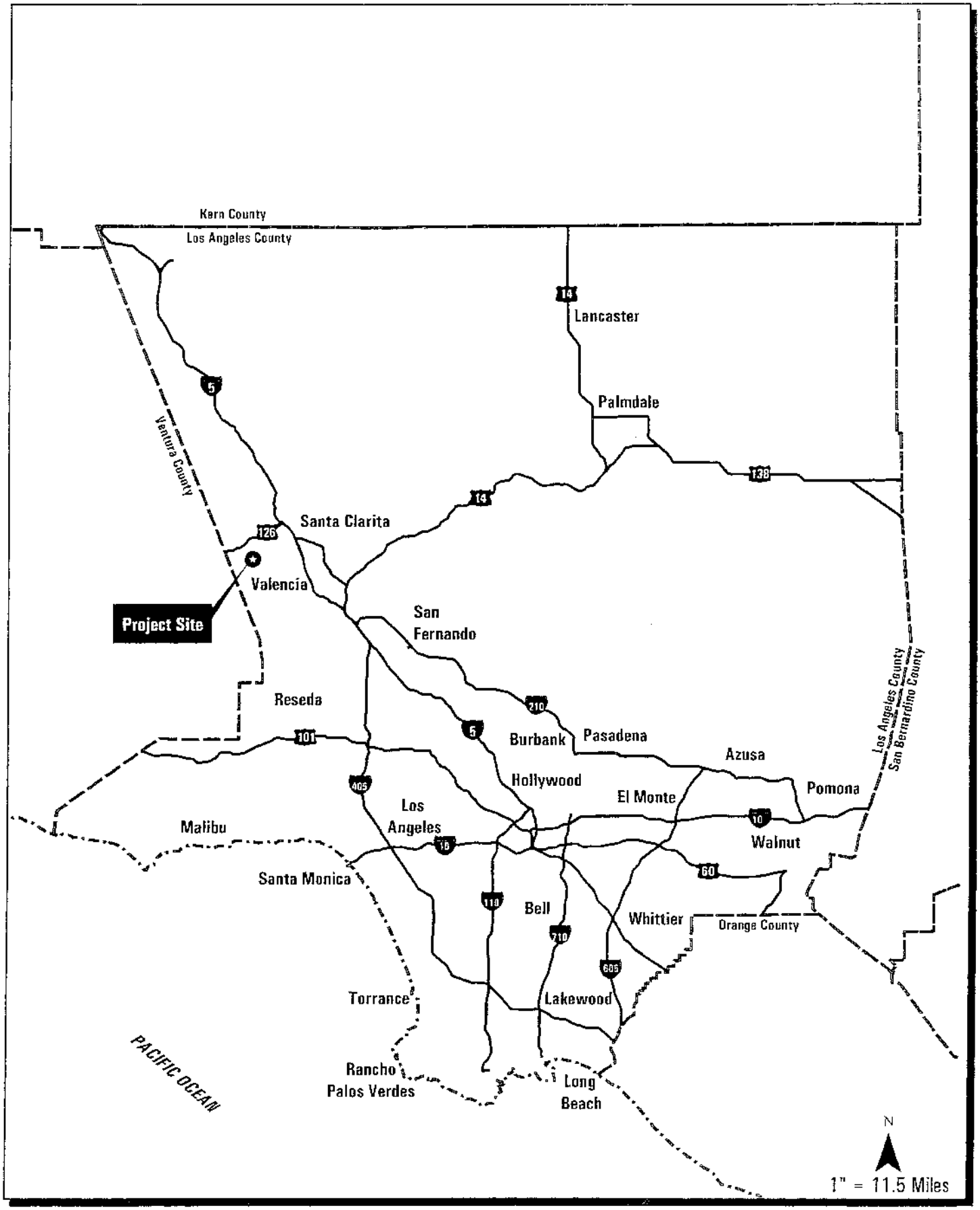
The purpose of this report is to document the results of surveys for sensitive plant species within the Newhall Ranch Specific Plan Area for the 2002 field season, with emphasis on the identification of populations of the state listed as endangered San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*; SFVS) and Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*) (a plant thought to be extinct until this rediscovery, however, work is currently being conducted to verify the identity of this plant).

2.0 SITE DESCRIPTION

The majority of the information in this section is summarized from the biota report prepared for the Newhall Ranch Specific Plan by RECON and Impact Sciences (1996), with soils and geology information obtained from a geologic evaluation prepared by Allan E. Seward Engineering Geology, Inc. (2002).

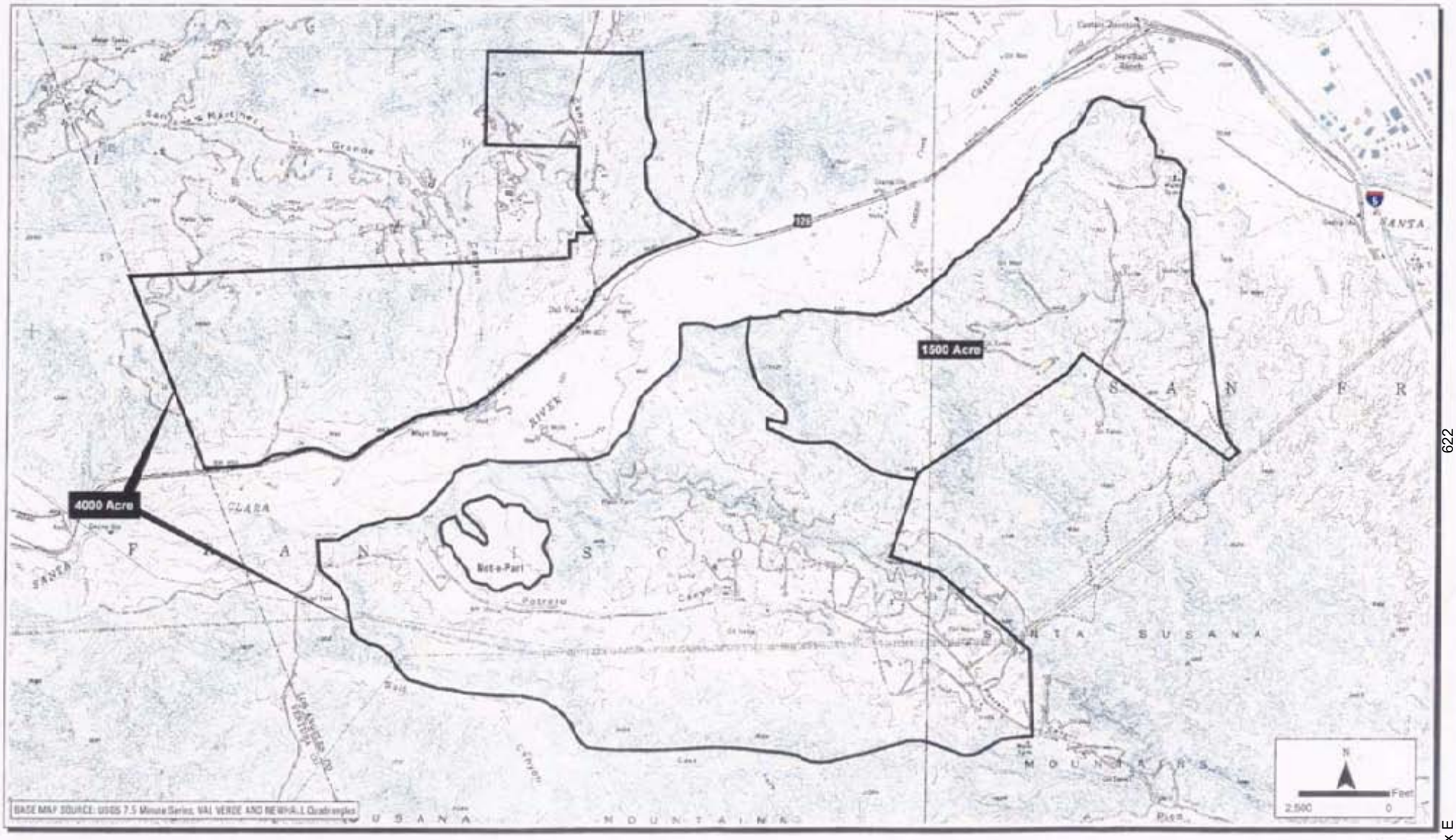
The Newhall Ranch Specific Plan study area is located in an unincorporated portion of the Santa Clara River Valley in northwestern Los Angeles County (*Figure 1*). It lies roughly one-half mile west of Interstate 5 and largely southwest of the junction of I-5 and State Route 126 (SR-126); with portions of the Specific Plan site located in San Martinez Grande and Chiquito canyons north of SR-126. The City of Santa Clarita is located to the east of the study area and its western border is the Ventura County/Los Angeles County line. Site elevations range from 825 feet above mean sea level (AMSL) in the Santa Clara River bottom at the Ventura County/Los Angeles County line to approximately 3,200 feet AMSL on the ridgeline of the Santa Susana Mountains along the southern boundary (*Figure 2*).

Dudek surveyed for sensitive plant species with varying levels of specificity within areas that are designated for development according to the approved Specific Plan. This area is approximately 6,229 acres and includes that area depicted as the "4,000-acre" and "1,500-acre" on *Figure 2*. For the most part, it includes all areas north of SR-126; however, it excludes the Santa Clara River, agriculture fields on Potrero Mesa, and areas proposed for conservation (most notably the "High Country" area). This study area is dominated by east-, west-, and northwest-trending primary ridges, with north- and south-trending secondary ridges. Site elevations range from approximately 850 feet AMSL in the Santa Clara River floodplain to approximately 2,000 feet AMSL along the ridgeline, which separates Potrero Canyon from Salt Creek Canyon and Grave Canyon. Slope gradients



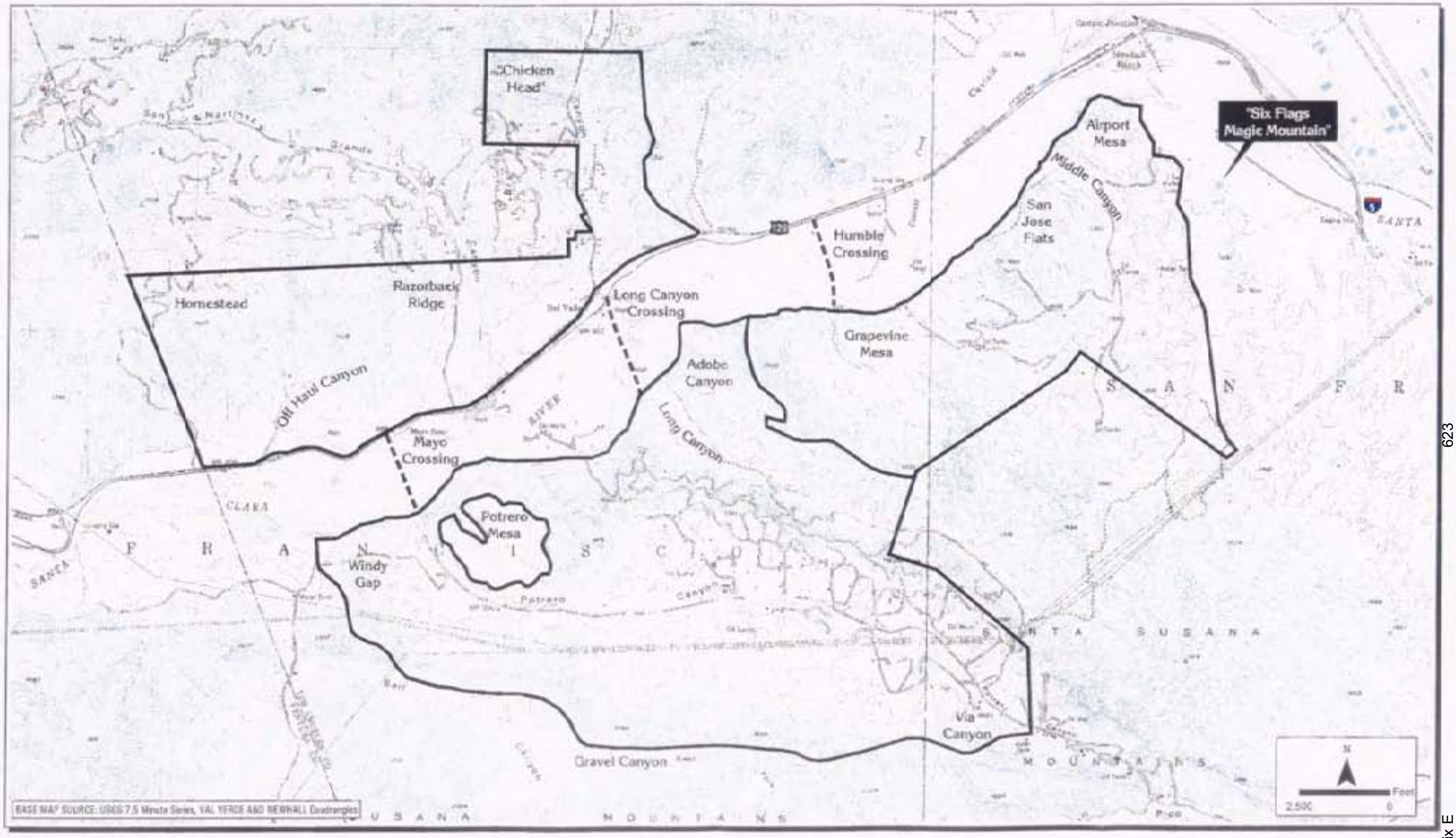
Newhall Ranch
Regional Map

FIGURE 1



Newhall Ranch
Vicinity Map

FIGURE 2



Newhall Ranch
Place Names

FIGURE 3

range from moderate to very steep in the hillside areas to very gentle within the Santa Clara River floodplain, tributary canyons and associated mesas. Distinctive elevated geographic features include Sawtooth Ridge; Razorback Ridge; Windy Gap; Ayers Rock; and Potrero, Grapevine, and Airport Mesas. Place names referenced in this report are depicted on *Figure* 3.

2.1 Plant Communities and Land Covers

Native and naturalized habitats within the study area are representative of those found in this region and provide high-quality examples of those plant communities found in the Santa Susana Mountains and the Santa Clara River ecosystems. Venturan coastal sage scrub, chamise and mixed chaparral, live and valley oak woodlands, and non-native grassland are the major upland plant communities both north and south of the Santa Clara River. Upland habitats dominate the landscape within the study area; however, the Santa Clara River supports a variety of riparian plant communities. These include southern cottonwood-willow riparian forest, southern willow scrub, mulefat scrub, arrow weed scrub, and freshwater marsh and seeps. Intermittent drainages onsite also provide habitat for alluvial and scalebroom scrubs.

The Newhall Land and Farming Company leases out portions of the study area for oil and natural gas production, as well as for cattle grazing and agricultural operations. All such operations are currently ongoing. Grazing activities have had a noticeable effect on much of the natural habitat onsite. Scrub habitats have been displaced by non-native grasslands as a result of grazing. Southern California Edison and Southern California Gas Company have distribution lines within easements onsite as well.

2.2 Geology and Soils

Geologically, the study area is located within the Transverse Ranges geomorphic province of southern California in the eastern portion of the Ventura depositional basin. This basin was produced by tectonic downwarping in the geologic past to produce a large-scale synclinal structure in which a thick sequence of Cenozoic sediments has accumulated. These sediments have been lithified into a sequence of sedimentary rock that has subsequently been uplifted, tilted, and tectonically deformed. They are cut by segments of the Del Valle and Salt Creek faults. Bedrock formations found onsite include the Modelo, Towsley, Pico, Saugus, and Pacoima formations, as well as Quaternary Terrace deposits. Surficial deposits include Quaternary alluvium, slopewash, soil, and artificial fill (Allan E. Seward 2002).

Information on soils contained herein is limited to that relevant to occurrences of SFVS and specifically excerpted from the Allen E. Seward letter report (2002) and will be discussed in *Section 4.3.4* below.

3.0 METHODS AND SURVEY LIMITATIONS

Data regarding botanical resources present on the project site were obtained through a review of the pertinent literature; field reconnaissance; and focused surveys for sensitive species, with varying levels of specificity; all of which are described below.

3.1 Literature Review

General floristic and sensitive botanical resources present or potentially present at Newhall Ranch were identified through a literature search using the following sources: the California Natural Diversity Database for the Newhall Santa Susana, Oat Mountain, Mint Canyon, San Fernando, Green Valley, Warm Springs Mountain, Whitaker Peak, Cobblestone Mountain, Piru, Simi, Thousand Oaks, and Val Verde quadrangle maps (CNDDB, September 2002); *Biological Resource Assessment of the Proposed Santa Susana Mountains/Simi Hills Significant Ecological Area* (PCR, November 2000); CalFlora (University of California, Berkeley, May 2002); U.S. Fish and Wildlife Service (USFWS 1999); California Department of Fish and Game (CDFG 2002); *Inventory of Rare and Endangered Plants of California* (CNPS 2001); *Vascular Flora of the Liebre Mountains, Western Transverse Ranges, California* (Boyd 1999); *Checklist of Rare Ventura County Plant Species* (Magney 2002); *A Flora of the Santa Barbara Region, California* (Smith 1976); *A Flora of the Santa Monica Mountains* (Raven *et al.* 1986); *Biology of the San Fernando Valley Spineflower, Ahmanson Ranch, Ventura County, California* (Glen Lukos Associates, Inc. and Sapphos Environmental, Inc. 2000); *Report to the Fish and Game Commission on the Status of San Fernando Valley Spineflower* (CDFG 2001); *Biota Report, Newhall Ranch Specific Plan* (RECON and Impact Sciences, Inc. 1996); and herbarium specimens from Rancho Santa Ana Botanic Garden (RSA) and the University of California, Riverside Herbarium (UCR). General information regarding vegetation communities was obtained from Holland (1986) and Sawyer and Keeler-Wolf (1995). Plant species nomenclature follows Hickman (1993).

3.2 Field Reconnaissance Methods

Botanical surveys were conducted by Dudek & Associates, Inc. (DUDEK) staff biologists, with assistance provided by Kim L. Marsden (California State Parks, Southern Service Center, San Diego), Rick Reifner (Glen Lukos Associates, Inc.), and Andrew C. Sanders (University of California, Riverside). All surveys were conducted on-foot and remote areas were accessed using four-wheel drive vehicles. Survey teams typically consisted of

two people, at least one of whom was a senior-level botanist. Resumes for survey personnel are provided in *Appendix A*.

Botanical surveys of the site were conducted between May and August (and one day in September) of 2002 in accordance with the schedule provided in *Table 1*. A minimum of 1,064 person-hours (133 person-days) was spent conducting botanical surveys within the study area. These surveys were conducted with three separate goals and levels of specificity: (1) From May 24 through June 7, surveys were focused on the location of SFVS polygons in those areas which had been identified earlier in the month by staff from the California Department of Fish & Game (CDFG). These surveys were concentrated in the Grapevine Mesa and Airport Mesa areas (see *Figure 3*) where CDFG had focused their efforts (pers. comm. Crowder & Hee, May 2002). (2) Between June 18 and June 27, surveys were conducted within an approximately 1,500-acre area (see *Figure 2*) and included searches for all federally and state listed, proposed for listing, and candidate species and California Native Plant Society (CNPS) List 1A, 1B, and 2 species. This list of target species is found in *Table 2*; and (3) From July 16 to August 28, surveys were focused on the identification and location of populations of SFVS in the additional 4,000-acre area, which included areas north of SR-126 and south of SR-126 (see *Figure 2*). Other sensitive plants were recorded incidentally when observed.

TABLE 1
Survey Schedule & Personnel
Newhall Ranch Specific Plan Area

DATE	BIOLOGISTS	PURPOSE	GENERAL SEARCHING AREA
5-24-02	Mark Elvin, Andrew Thomson	Coordination with CDFG and Newhall regarding SFVS	Grapevine and Airport mesas
5-29-02	Mark Elvin, Julie Vanderwier, Tricia Wotipka, Andrew Thomson	Location of SFVS previously identified by CDFG	Grapevine Mesa area
5-30-02	Mark Elvin, Julie Vanderwier, Tricia Wotipka, Andrew Thomson	Location of SFVS previously identified by CDFG	Grapevine Mesa area
5-31-02	Mark Elvin, Julie Vanderwier, Tricia Wotipka, Andrew Thomson	Location of SFVS previously identified by CDFG	Grapevine Mesa area
6-5-02	Mark Elvin, Julie Vanderwier, Megan Enright, Scott Boczkiewicz	Location of SFVS previously identified by CDFG	Airport Mesa area
6-6-02	Mark Elvin, Julie Vanderwier, Megan Enright, Scott Boczkiewicz	Location of SFVS previously identified by CDFG	Airport Mesas area
6-7-02	Mark Elvin, Julie Vanderwier, Megan Enright, Scott Boczkiewicz	Location of SFVS previously identified by CDFG	Airport Mesa area
6-18-02	Mark Elvin, Julie Vanderwier, Andrew Sanders, Kim Marsden	Focused surveys for sensitive plant species -- 1,500-acre study area	Canyon west of Grapevine Mesa; canyons and mesas east of Sawtooth Ridge

TABLE 1
Survey Schedule & Personnel
Newhall Ranch Specific Plan Area

DATE	BIOLOGISTS	PURPOSE	GENERAL GEOGRAPHIC AREA
6-19-02	Mark Elvin, Julie Vanderwier, Andrew Sanders, Kim Marsden	Focused surveys for sensitive plant species -- 1,500-acre study area	Slopes associated with Grapevine Mesa and smaller mesas and canyons to the west
6-20-02	Mark Elvin, Julie Vanderwier, Andrew Sanders, Kim Marsden	Focused surveys for sensitive plant species - 1,500-acre study area	Lion Canyon; canyon east of Grapevine Mesa; south side of Santa Clara River west of Humble Crossing
6-25-02	Mark Elvin, Julie Vanderwier, Megan Enright	Focused surveys for sensitive plant species - 1,500-acre study area	East of Airport Mesa; canyon east of Sawtooth Ridge, Castaic Spring
6-26-02	Mark Elvin, Julie Vanderwier, Megan Enright	Focused surveys for sensitive plant species -- 1,500-acre study area	Middle Canyon; San Jose Flats; canyons south and east of Grapevine Canyon
6-27-02	Mark Elvin, Julie Vanderwier, Megan Enright	Focused surveys for sensitive plant species - 1,500-acre study area	Long Canyon; canyon east of Grapevine Mesa
7-16-02	Mark Elvin, Julie Vanderwier	Focused surveys for SFVS -- 4,000-acre study area	Long Canyon; habitat overview
7-17-02	Mark Elvin, Julie Vanderwier	Focused surveys for SFVS -- 4,000-acre study area	Potrero and Long Canyons
7-18-02	Mark Elvin, Julie Vanderwier	Focused surveys for SFVS – 4,000-acre study area	Habitat and areas surrounding Potrero Mesa; ridgeline between Salt Creek Canyon and Potrero Canyon
7-26-02	Julie Vanderwier, Kim Marsden, Vipul Joshi	Focused surveys for SFVS -- 4,000-acre study area	Adobe Canyon and east side of Long Canyon
7-27-02	Julie Vanderwier, Kim Marsden, Vipul Joshi	Focused surveys for SFVS -- 4,000-acre study area	North side of lower Potrero Canyon
7-30-02	Mark Elvin, Andrew Sanders, Cathleen Weigand	Focused surveys for SFVS – 4,000-acre study area	North side of upper Potrero Canyon
7-31-02	Mark Elvin, Andrew Sanders, Cathleen Weigand	Focused surveys for SFVS – 4,000-acre study area	North side of Middle Potrero Canyon
8-1--02	Mark Elvin, Andrew Sanders, Cathleen Weigand	Focused surveys for SFVS -- 4,000-acre study area	North and south sides of middle Potrero Canyon; Adobe Canyon
8-6-02	Mark Elvin, Julie Vanderwier, Michelle Balk, Megan Enright, Andrew Sanders, Cathleen Weigand	Focused surveys for SFVS – 4,000-acre study area	Chiquito Canyon and upper eastern San Martinez Grande Canyon; Long Canyon
8-7-02	Mark Elvin, Julie Vanderwier, Michelle Balk, Megan Enright, Andrew Sanders, Cathleen Weigand	Focused surveys for SFVS – 4,000-acre study area	South side of Potrero Canyon; Long Canyon; between San Martinez Grande and Chiquito Canyons
8-8-02	Mark Elvin, Julie Vanderwier, Michelle Balk, Megan Enright, Andrew Sanders, Cathleen Weigand	Focused surveys for SFVS -- 4,000-acre study area	East side of San Martinez Grande Canon, south side of upper Potrero Canyon

TABLE 1
Survey Schedule & Personnel
Newhall Ranch Specific Plan Area

DATE	BIOLOGISTS	PURPOSE	GENERAL GEOGRAPHIC AREA
8-12-02	Mark Elvin, Julie Vanderwier, Scott Boczkiewicz, Tricia Wotipka, Michelle Balk, Cathleen Weigand	Focused surveys for SFVS -- 4,000-acre study area	South side of upper Potrero Canyon; Via Canyon; ridgeline between Salt Creek and Potrero Canyons
8-13-02	Mark Elvin, Scott Boczkiewicz, Tricia Wotipka, Michelle Balk, Cathleen Weigand	Focused surveys for SFVS -- 4,000-acre study area	South side of Lower Potrero Canyon; Peppertree Canyon
8-14-02	Mark Elvin, Scott Boczkiewicz, Tricia Wotipka, Michelle Balk, Cathleen Weigand	Focused surveys for SFVS – 4,000-acre study area	Upper and lower Potrero Canyon
8-20-02	Mark Elvin, Julie Vanderwier, Tricia Wotipka, Cathleen Weigand	Focused surveys for SFVS -- 4,000-acre study area	East side of Chiquito Canyon; drainage on east side of road
8-21-02	Mark Elvin, Julie Vanderwier, Tricia Wotipka, Cathleen Weigand	Focused surveys for SFVS – 4,000-acre study area	Upper west side San Martinez Grande Canyon; east side Chiquito Canyon
8-22-02	Mark Elvin, Julie Vanderwier, Tricia Wotipka	Focused surveys for SFVS – 4,000-acre study area	West side of San Martinez Grande Canyon; Homestead Canyon
8-26-02	Mark Elvin, Julie Vanderwier, Andrew Sanders, Michelle Balk, Cathleen Weigand, Paul Lemons	Focused surveys for SFVS – 4,000-acre study area	East side of San Martinez Grande Canyon; Homestead Canyon
8-27-02	Mark Elvin, Julie Vanderwier, Andrew Sanders, Michelle Balk, Cathleen Weigand, Paul Lemons	Focused surveys for SFVS – 4,000-acre study area	East side of San Martinez Grande Canyon; Homestead and Off Haul Canyons
8-28-02	Mark Elvin, Julie Vanderwier, Andrew Sanders, Michelle Balk, Cathleen Weigand, Paul Lemons	Focused surveys for SFVS -- 4,000-acre study area	Ridgeline area, north side of Potrero Canyon; Razorback Ridge; the "chicken head"
9-5-02	Mark Elvin, Tricia Wotipka	Mapping surveys for SFVS -- 1,500-acre site	Grapevine and Airport Mesas

TABLE 2
Sensitive Plant Species Subject of Field Surveys

Scientific Name	Common Name
Arenaria paludicola	marsh sandwort
Astragalus brauntonii	Braunton's milk-vetch
Atriplex coulteri	Coulter's saltbush
Atriplex serenana var. *davidsonii*	Davidson's saltscale
Baccharis malibuensis	Malibu baccharis
Berberis nevinii	Nevin's barberry
Brodiaea filifolia	thread-leaved brodiaea
Calochortus clavatus var. *clavatus*	club-haired mariposa lily
Calochortus clavatus var. *gracilis*	slender mariposa lily
Calochortus plummerae	Plummer's mariposa lily
Calochortus weedii var. *vestus*	late-flowered mariposa lily
Calystegia peirsonii	Peirson's morning-glory
Calystegia sepium ssp. *binghamiae*	Santa Barbara morning-glory
Centromadia [= *hemizonia*] *parryi* ssp. *australis*	southern tarplant
Cercocarpus betuloides var. *blancheae*	island mountain-mahogany
Chorizanthe parryi var. *fernandina*	San Fernando Valley spineflower
Deinandra [= *Hemizonia*] *minthornii*	Santa Susana tarplant
Dodecahema leptoceras	slender-horned spineflower
Dudleya blochmaniae var. *blochmaniae*	Blochman's dudleya
Dudleya cymosa ssp. *agourensis*	Santa Monica Mountains dudleya
Dudleya cymosa ssp. *marcescens*	marcescent dudleya
Dudleya cymosa ssp. *ovatifolia*	Santa Monica Mountains dudleya
Dudleya multicaulis	Many-stemmed dudleya
Dudleya parva	Conejo dudleya
Erodium macrophyllum	round-leaved filaree
Helianthus nuttallii ssp. *parishii*	Los Angeles sunflower
Horkelia cuneata var. *puberula*	mesa horkelia
Juglans californica	southern California black walnut
Malacothamnus davidsonii	Davidson's bush mallow
Nama stenocarpum	mud nama
Nolina cismontana	chaparral nolina
Opuntia basilaris var. *brachyclada*	short-joint beavertail
Oxytheca parishii var. *abramsii*	Abram's oxytheca
Pentachaeta lyonii	Lyon's pentachaeta
Rorippa gambellii	Gambel's water cress
Senecio aphanactis	rayless ragwort
Sidalcea neomexicana	salt spring checkerbloom
Thelypteris puberula var. *sonorensis*	Sonoran maiden fern

All plant species encountered during the field surveys were identified and recorded for inclusion in *Appendix B*. The majority of these were vouchered and will be reposited at the herbarium at the University of California, Riverside. Latin and common names of plants follow *The Jepson Manual* (Hickman 1993) or other recent published taxonomic treatments. Where not listed in Hickman (1993), common names were taken from Abrams (1923). Where not found in this reference, a variety of sources were used (*e.g.*, Abrams 1923, Dale 1986, or Roberts 1998).

Surveys for those additional sensitive plant species within the 1,500-acre study area (*Table 2*) were conducted based upon the habitat preference, habit, and phenology for each species, and using professional experience and information gathered from those sources discussed in *Section 2.1* above. Surveys for SFVS in the 1,500-acre and 4,000-acre study areas were focused in open areas of Venturan coastal sage scrub (purple sage series) and non-native grassland (California annual grassland series) on ridgelines, slopes, and escarpments with a southern, southwestern, or southeastern exposure based on information gathered during the documentation of SFVS populations flagged by CDFG; information contained in the report prepared by Glen Lukos Associates, Inc. (2002); the status report prepared for the Fish and Game Commission (CDFG 2000); and conversations with Rick Reifner, the botanist who re-discovered SFVS at Ahmanson Ranch in 1999. Chaparral and riparian communities, including the Santa Clara River floodplain, were not surveyed. Information regarding co-occurring plant species, general soils observations, and population estimates (based on counts of small areas and extrapolating an estimate for the polygon as a whole) were noted at those locations where SFVS was found, along with whether the plants were from the current year or before (pre-2002).

3.2.1 Sensitive Plant Species

Sensitive plant species are those species that have been given special recognition by federal, state, or local conservation agencies and organizations due to limited, declining, or threatened population sizes. This includes those species listed by the state and federal government as threatened or endangered, those species proposed for state and/or federal listing or candidates, those plant species found on Lists 1A, 1B or 2 of the California Native Plant Society's *Inventory of Rare and Endangered Plants of California* (CNPS 2001; *Inventory*), and those plant species which are found on the list of "Threatened and Endangered Species and Species of Concern, Los Angeles County" (http://www.losangelesalmanac.com/topics/Environment/ ev14b.htm). CNPS List 3 or List 4 species were included in discussions only when encountered during the field surveys.

3.2.2 Survey Limitations

Surveys were conducted in late spring and summer of 2002, which was the driest year in recorded history for Los Angeles County (It began keeping records in 1877). Less than 4.5" of rain fell on the County, which is less than a third of the "normal" amount (Los Angeles Times, June 30, 2002; Western Regional Climate Center 2002; www.wrcc.edu). Some surveys were conducted late in the season (*e.g.*, surveys for the 4,000-acre site ran until September). These factors affected the detection of annual plants and geophytic perennials more than most plants because few annuals or geophytes were observed growing this year (compared to the many stalks and/or dried remains of plants from the previous year). A number of the sensitive plants on our focused survey list were either annuals or geophytes and they either had a poor rate of detection or were not observed.

The few annual and geophyte species that were observed during the field work at Newhall Ranch represent a very small fraction of the density and/or diversity of these species which are known or are likely to occur onsite (Vanderwier 1995; RECON and Impact Sciences 1996). This may also be true of other perennial plants. Spring surveys during a year with a "normal" amount of rainfall will provide better conditions to determine the diversity of species (including sensitive plants) onsite and map their distributions more accurately (when necessary).

Additionally, the entire study area was not surveyed at an equal level of specificity. Within the 1,500-acre study area, surveys were directed towards the detection of all of the species identified in *Table 2*; however, within the remaining acreage, focused surveys were conducted for current-year SFVS plants. Other sensitive species were recorded when incidentally observed.

The focused surveys for SFVS concentrated on locating additional populations within the study area in order to determine the taxon's gross distribution within the Newhall Ranch Specific Plan boundaries. As SFVS populations were identified in an area, the occurrence/polygon was mapped using a GPS and then efforts were redirected to new areas. The predominant observations of SFVS on south-facing slopes may be an artifact of the search parameters used in this survey. We concentrated our efforts in areas that we felt had the highest likelihood to have SFVS. Focused spring surveys for SFVS (and other sensitive species) during a year with average rainfall will be needed to provide the detailed mapping necessary to determine impacts for project-specific plans as part of the environmental review for each implementing map.

4.0 RESULTS OF SURVEYS

4.1 Botany - Floral Diversity

The study area is situated at the nexus of the Transverse Ranges, Coast Ranges, Sierra Nevada, Mojave Desert, and coastal plains (Hickman 1993). Ecotone areas such as this are often characterized by higher biological diversity than similar-sized areas within the core of a physiographic region (Boyd 1999). As such, a high diversity of plant species is expected during a year of average rainfall for the area.

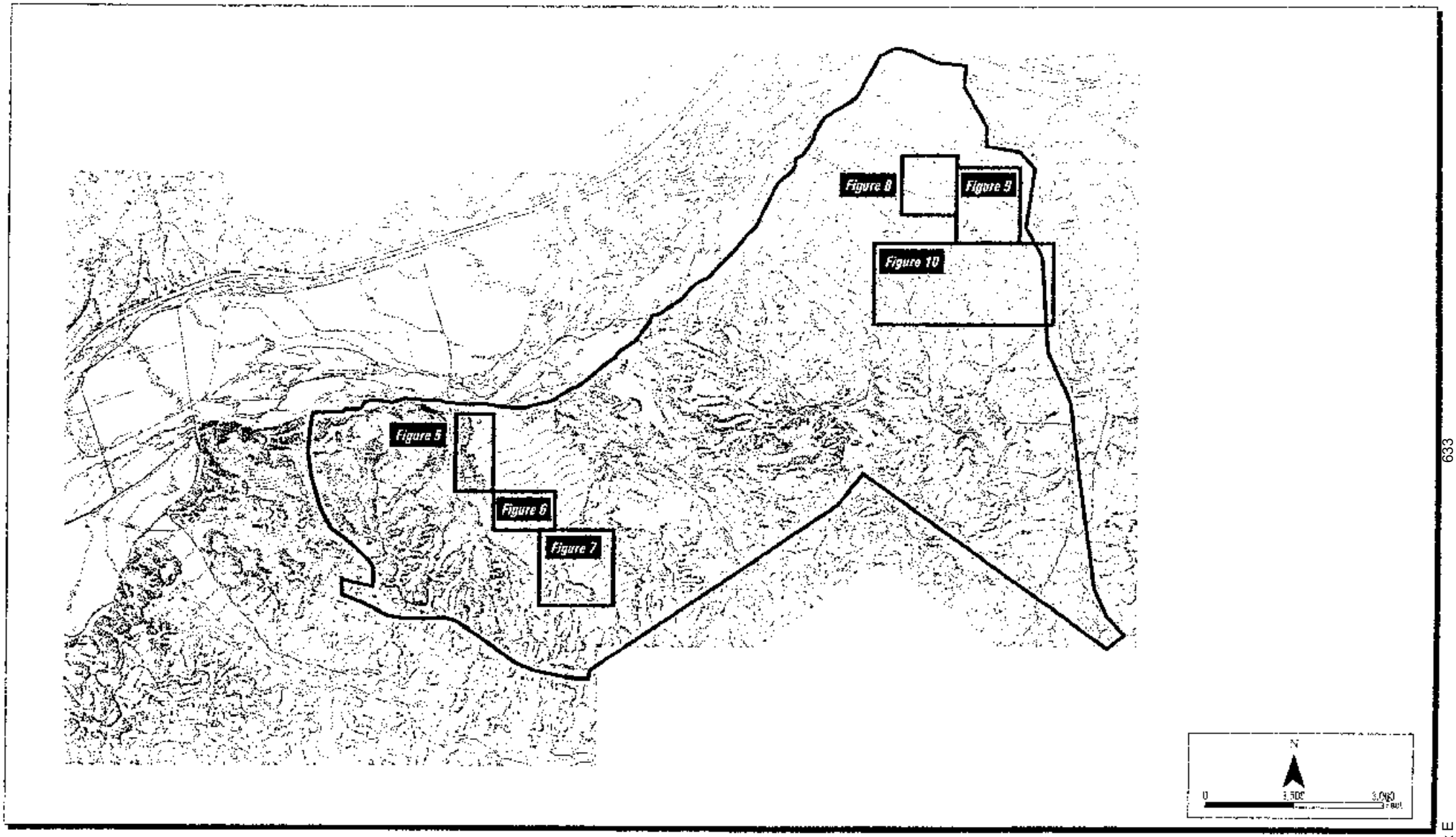
At least 431 plant species were identified within the Newhall Ranch study area. Of these, 291 species (or 68 percent) are native to the region and 140 species (or 32 percent) are non-native. It should be noted that agricultural or clearly disturbed areas were not thoroughly searched. The list of plant species identified within the study area in 2002 is provided as *Appendix B*.

4.2 Sensitive Plant Species

Eight sensitive plant species were identified within the study area. These and other sensitive species that have the potential to occur within the Newhall Ranch project area, based on the presence of suitable habitat and soils, are listed in *Table 3*. This list is confined primarily to those species listed by the state and federal government as threatened or endangered, those species proposed for state and/or federal listing or candidates, those plant species found on Lists 1A, 1B, or 2 of the California Native Plant Society's *Inventory of Rare and Endangered Plants of California* (CNPS 2001). Those species that were observed during the 2002 field surveys are discussed in greater detail. A number of species found on CNPS Lists 3 or 4 also have the potential to occur onsite (*e.g., Calochortus catalinae, Acanthomintha obovata* ssp. *cordata, Mucronea californica*); however, due to their relatively low sensitivity level, they are only discussed in the following sections if observed onsite.

Figures 4 through *11* depict the locations of SFVS on Grapevine Mesa, Airport Mesa, and in San Martinez Grande Canyon, respectively. *Figures 12* through *15* depict other sensitive species identified in the 1,500-acre study area while *Figures 16* through *21* depict those sensitive species found in the 4,000-acre study area.

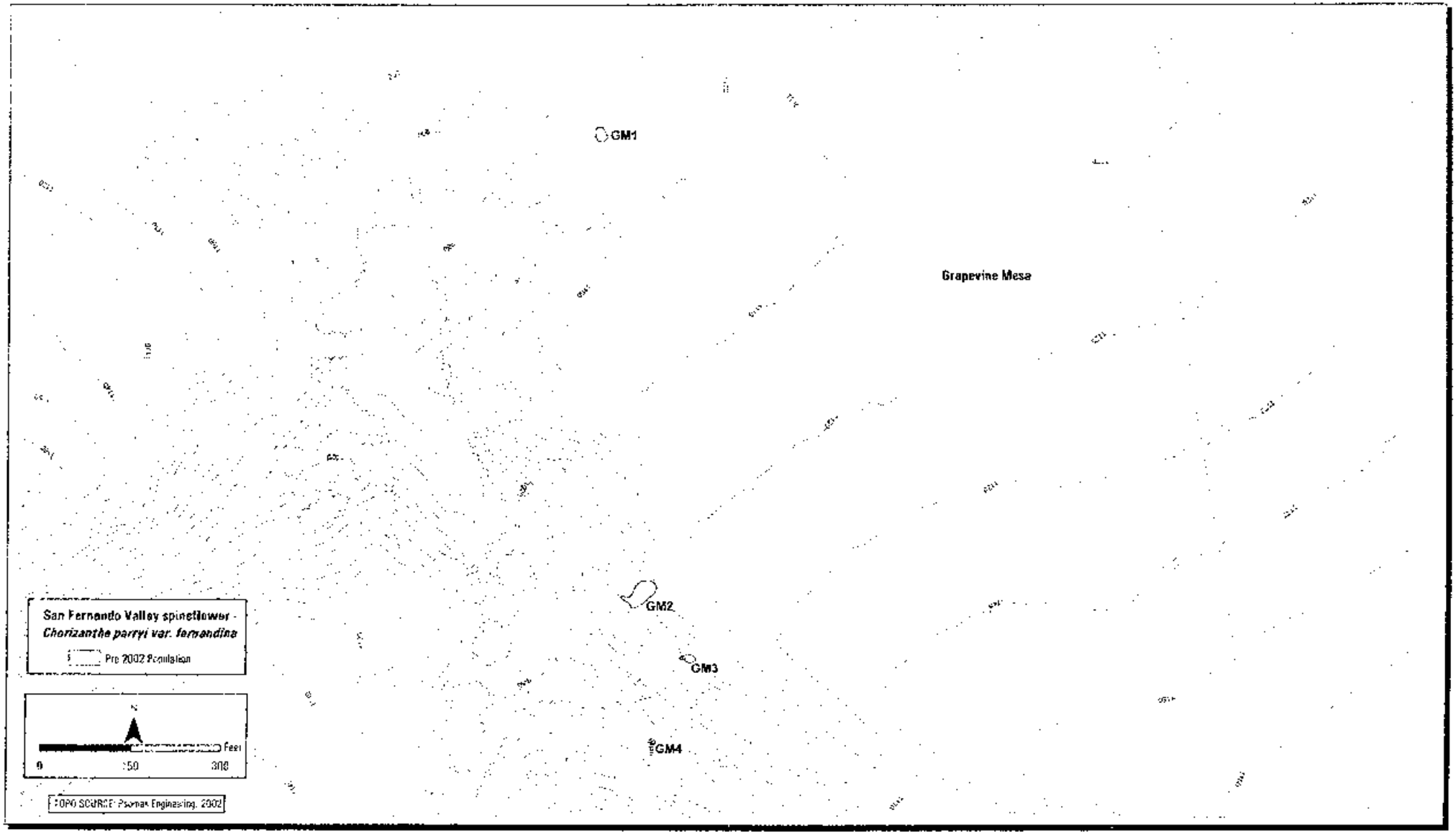
While surveying in the field and mapping SFVS, DUDEK used a 4-meter (13.1 feet) rule to separate polygons. We chose this distance based on the topography, vegetation, detectability of the plants, general accuracy of the GPS that we used, and time constraints. This distance does not have any known relevance to SFVS biology (*i.e.*,



Newhall Ranch

San Fernando Valley spineflower Index - 1500-acre Survey Area

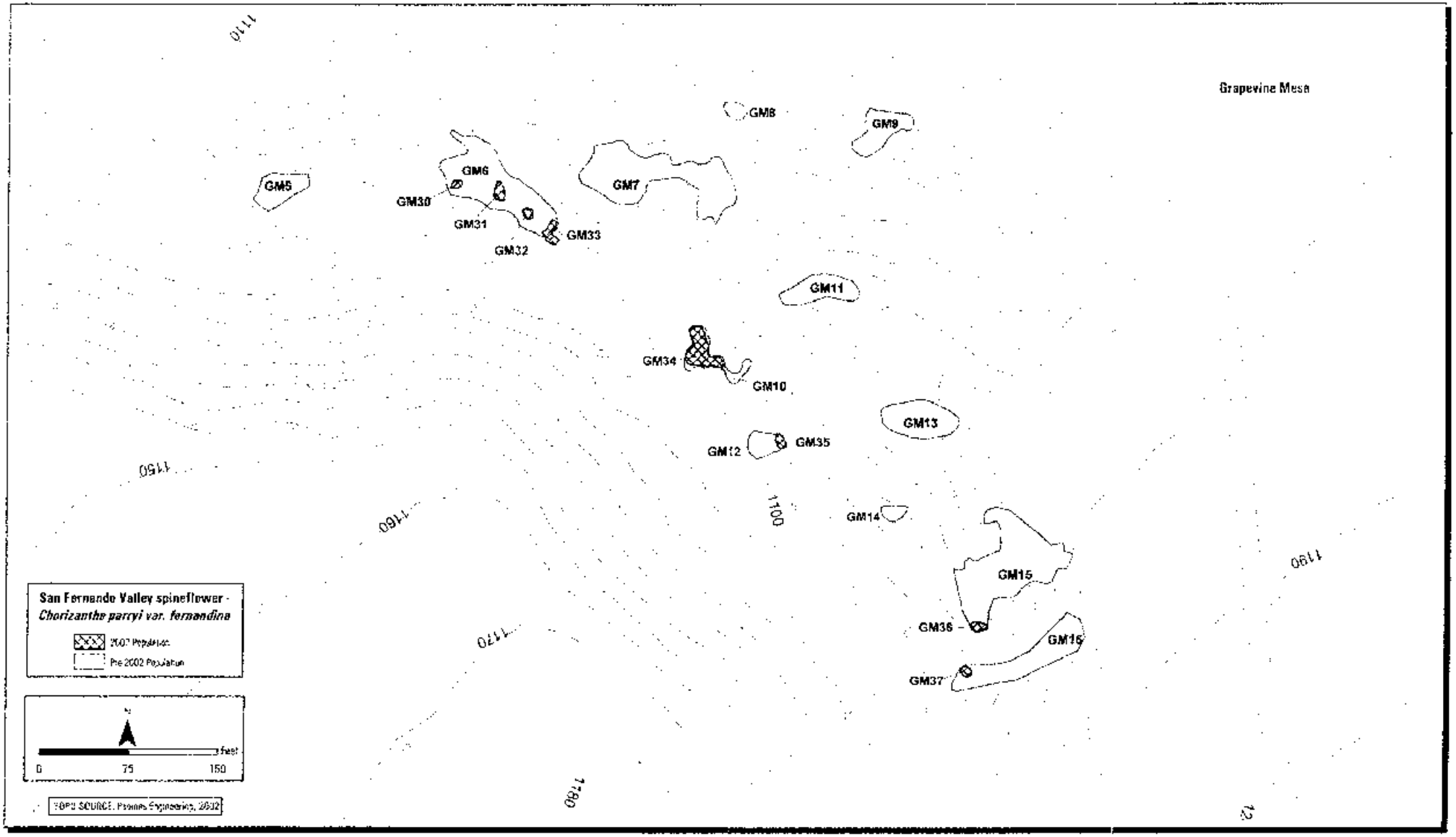
FIGURE 4



Newhall Ranch

San Fernando Valley spineflower - Grapevine Mesa Area

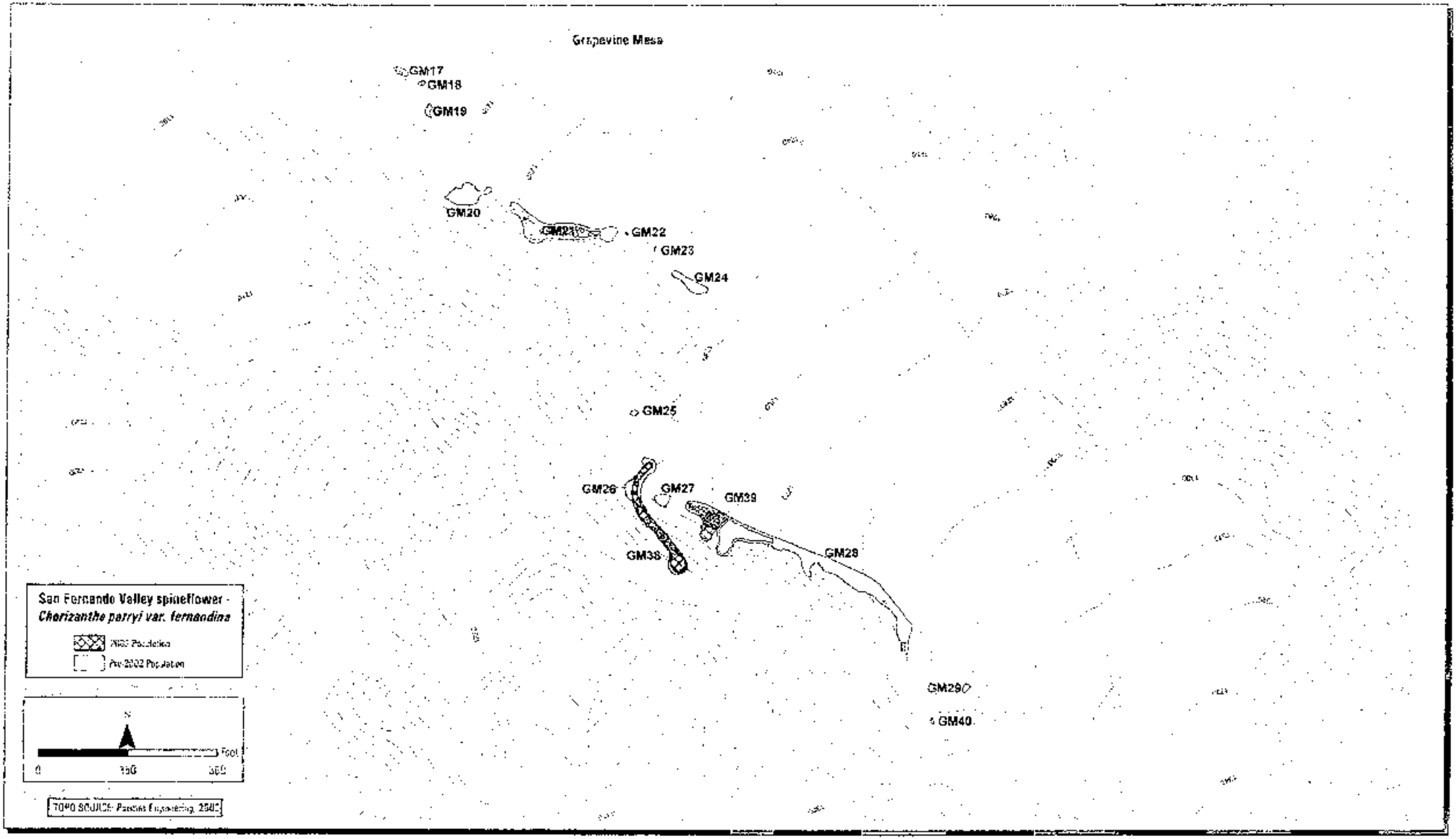
FIGURE 5



Newhall Ranch

San Fernando Valley spineflower - Grapevine Mesa Area

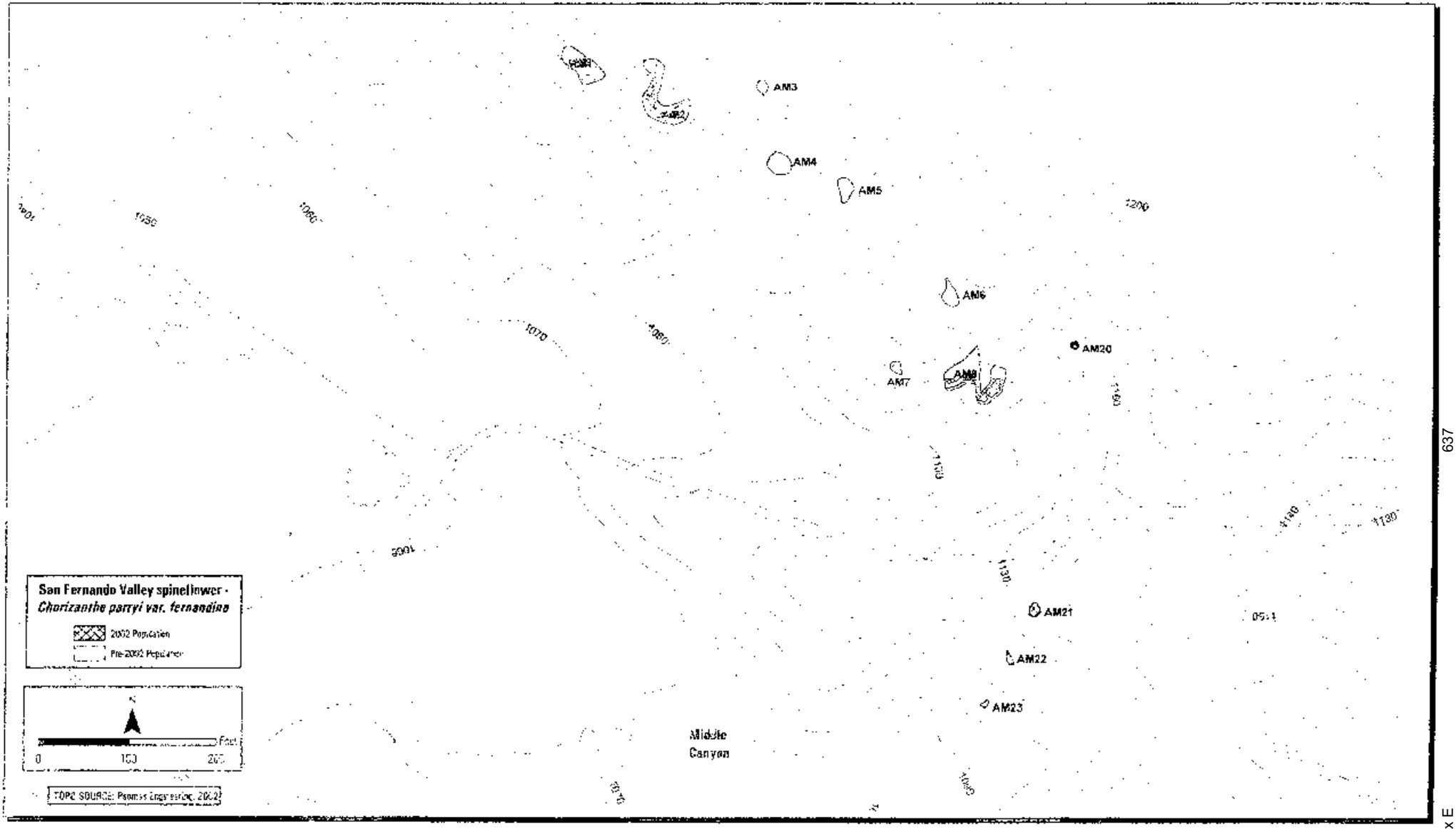
FIGURE 6



Newhall Ranch

San Fernando Valley spineflower - Grapevine Mesa Area

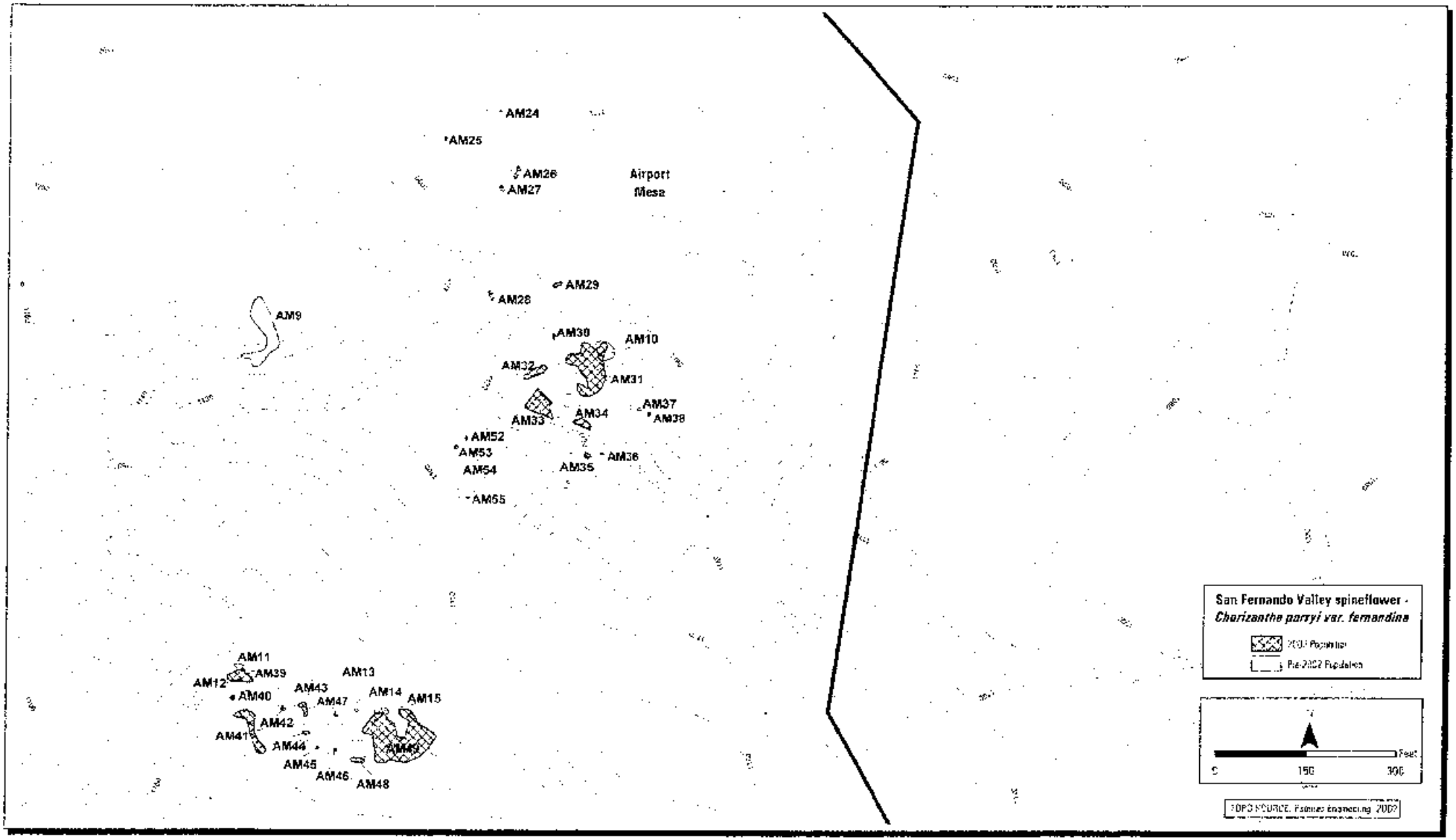
FIGURE 7



Newhall Ranch

San Fernando Valley spineflower - Airport Mesa Area

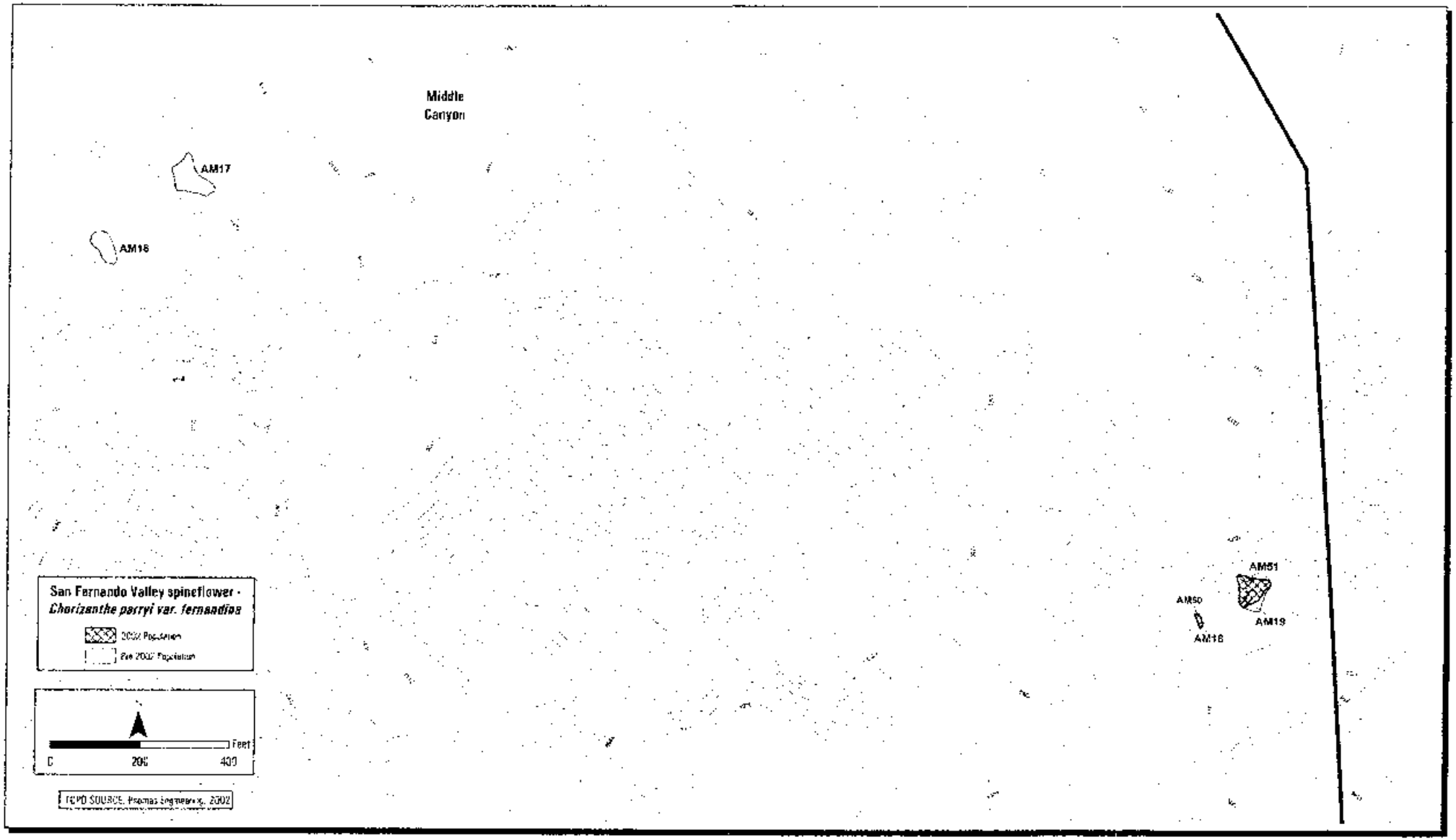
FIGURE 8



Newhall Ranch

San Fernando Valley spineflower - Airport Mesa Area

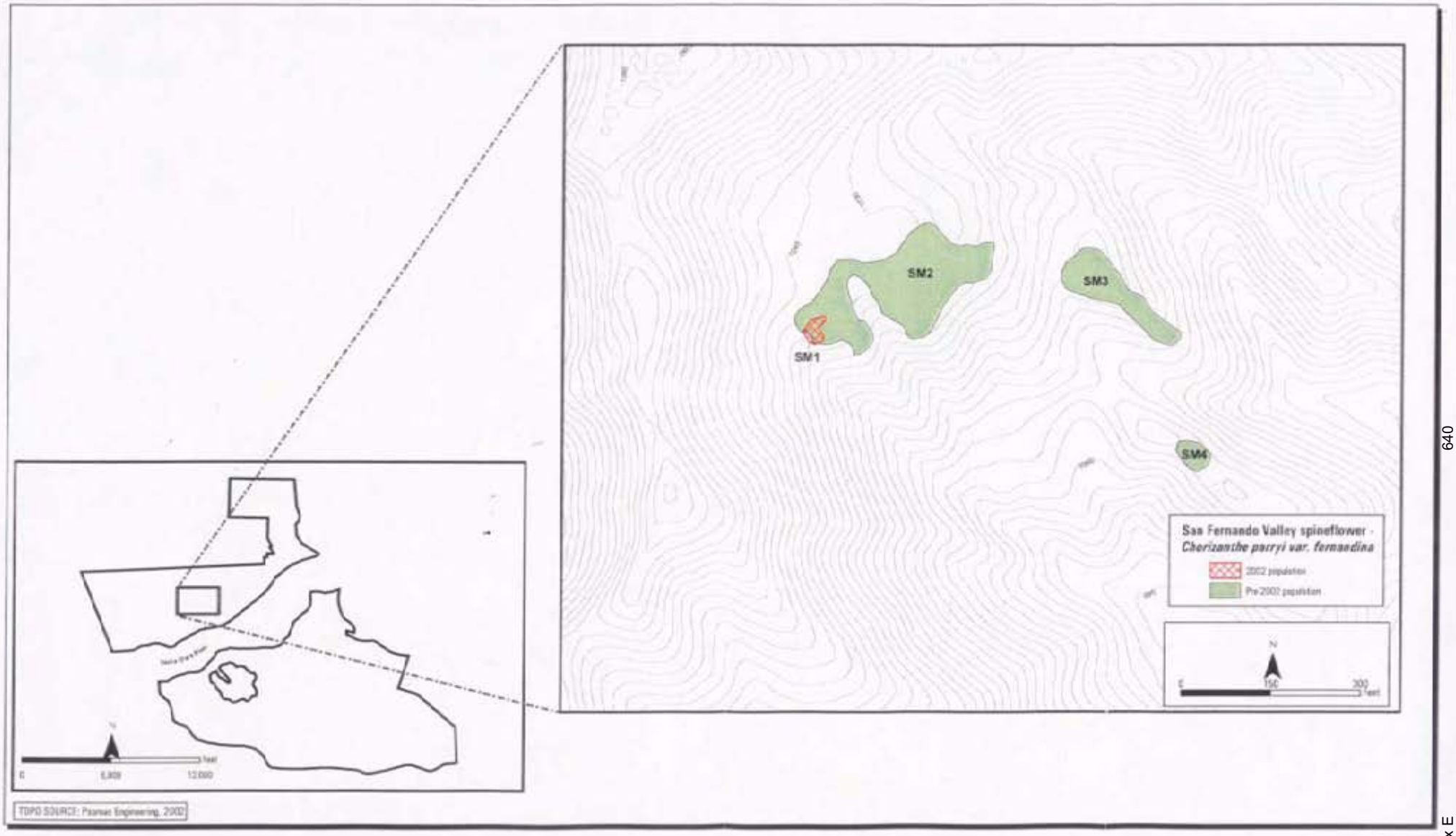
FIGURE 9



Newhall Ranch

San Fernando Valley spineflower - Airport Mesa Area

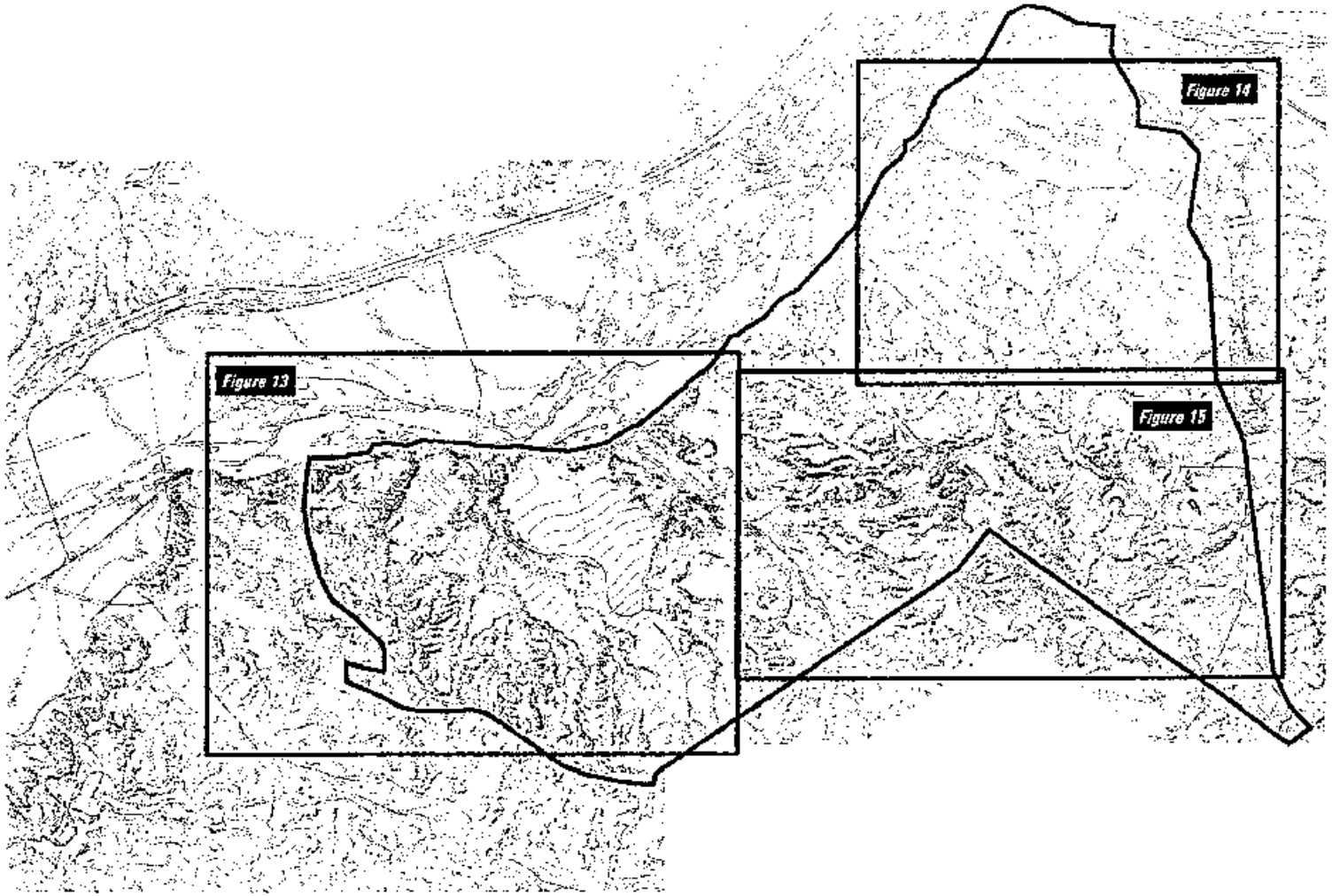
FIGURE 10

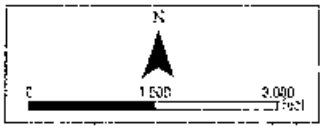


Newhall Ranch

San Fernando Valley spineflower - San Martinez Grande Canyon Area

FIGURE 11

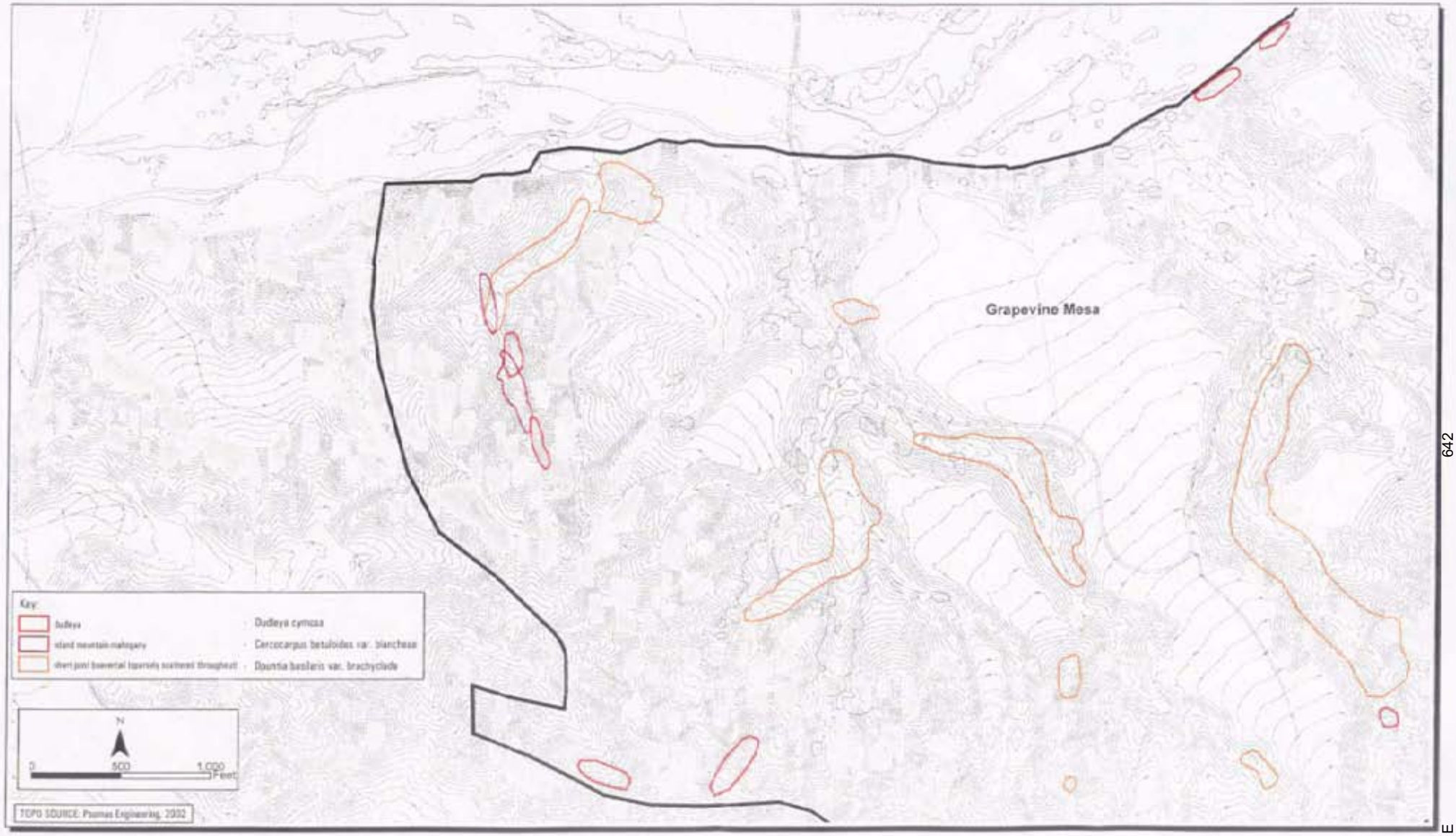




Newhall Ranch

2002 Sensitive Plant Species Survey Index - 1500-acre Survey Area

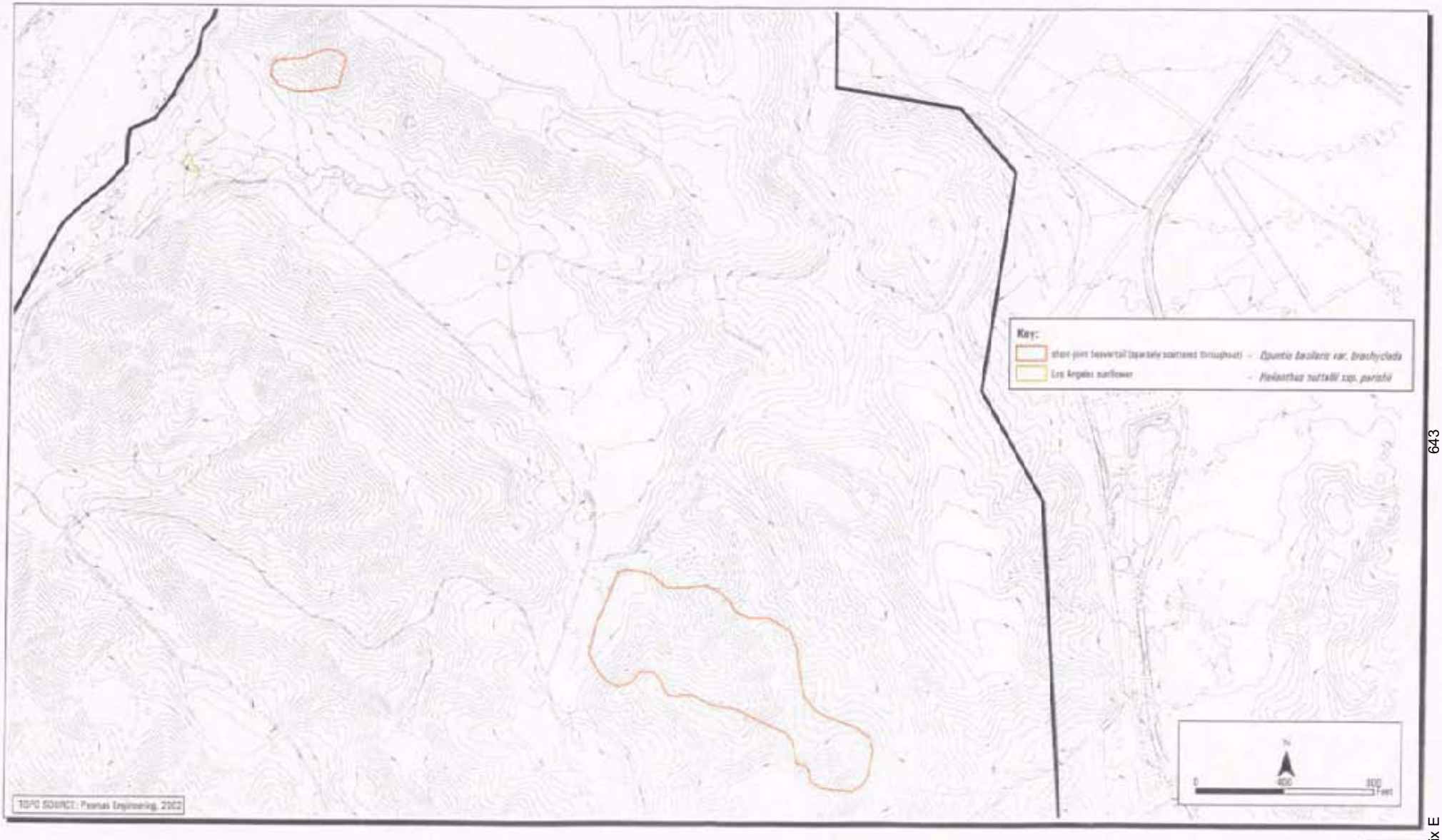
FIGURE 12



Newhall Ranch

2002 Sensitive Plant Species Results - 1500-acre Survey Area

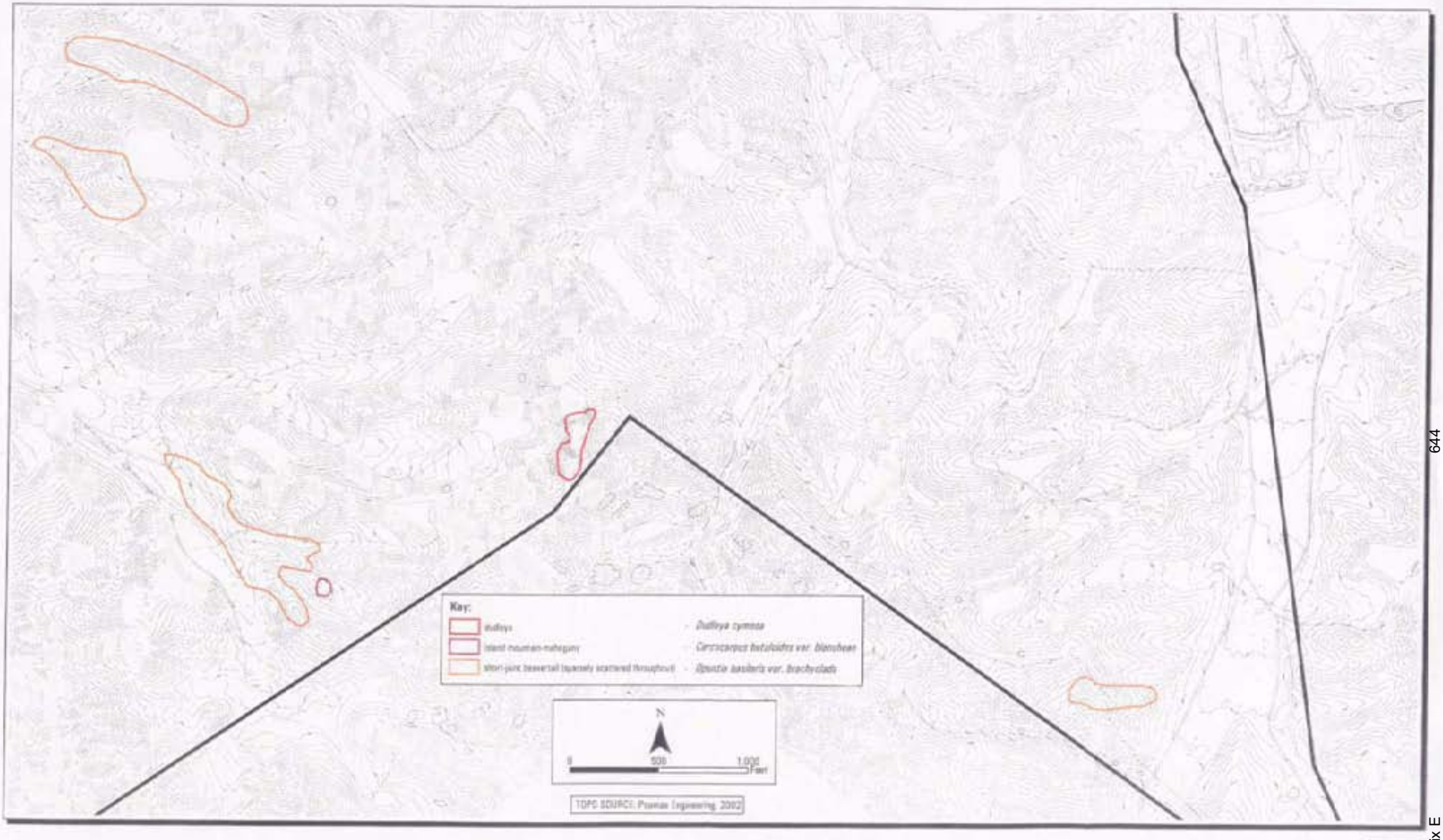
FIGURE 13



Newhall Ranch

2002 Sensitive Plant Species Results - 1500-acre Survey Area

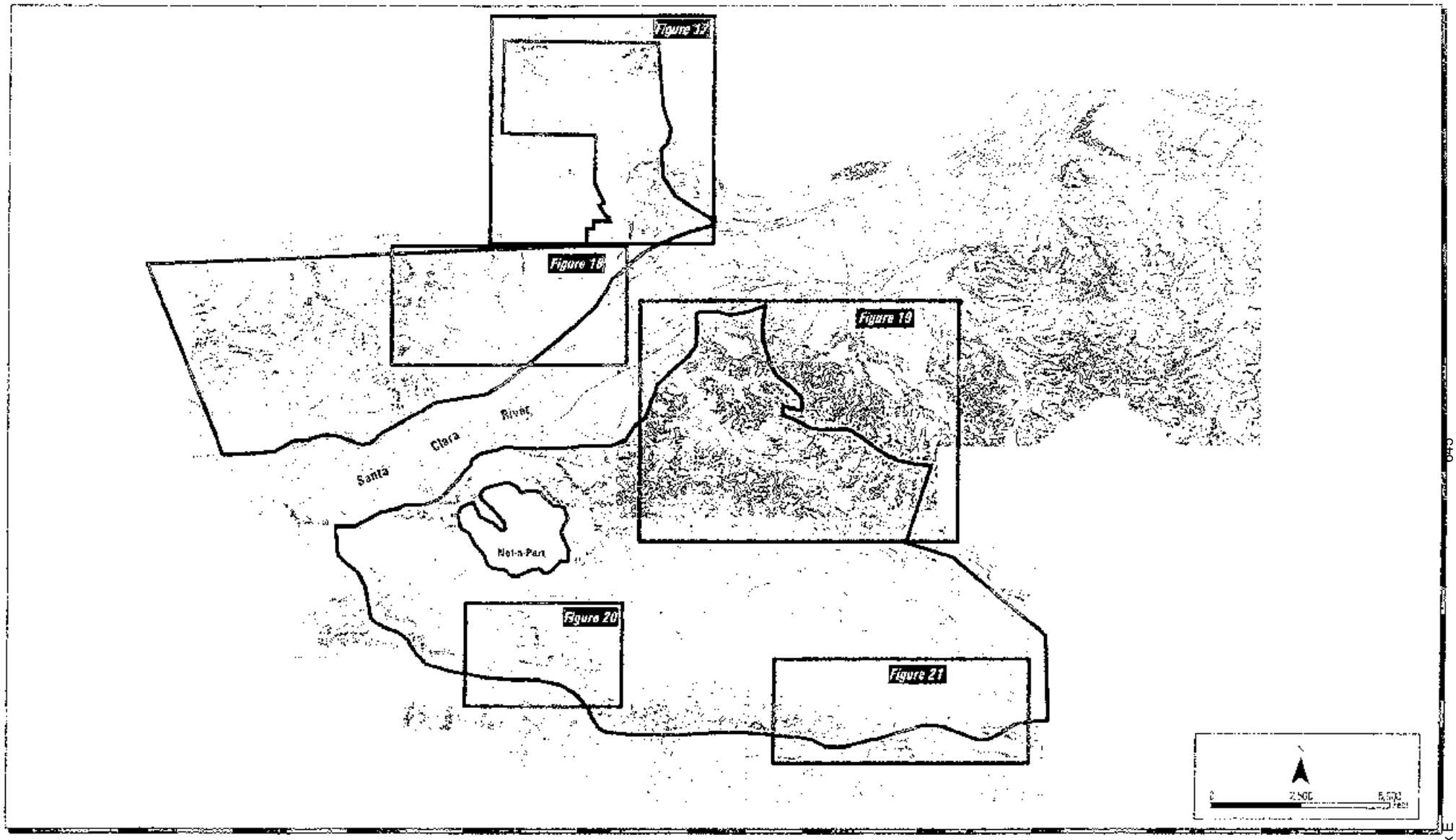
FIGURE 14



Newhall Ranch

2002 Sensitive Plant Species Results - 1500-acre Survey Area

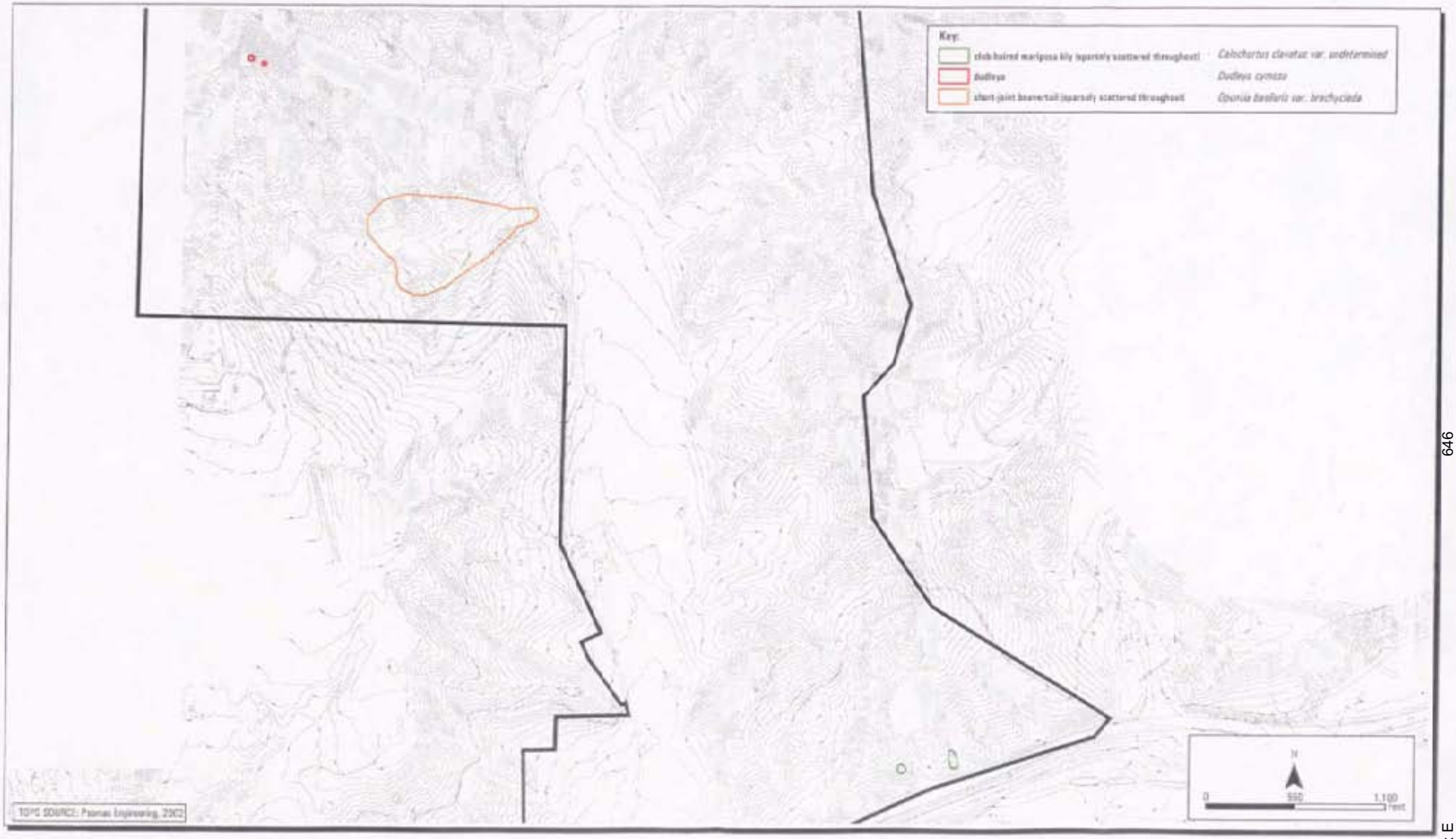
FIGURE 15



Newhall Ranch

2002 Sensitive Plant Species Survey Index - 4000-acre Survey Area

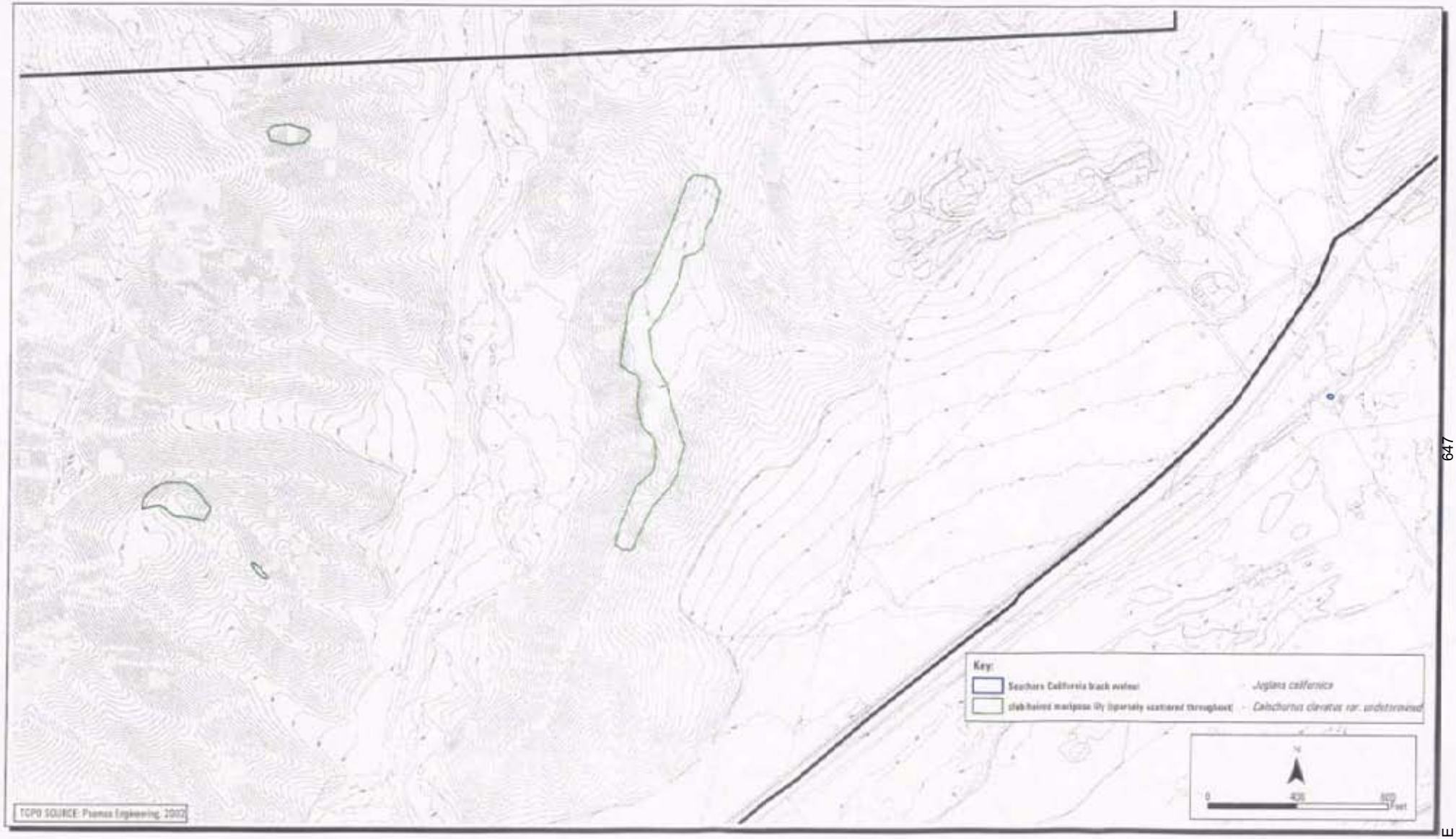
FIGURE 16



Newhall Ranch

2002 Sensitive Plant Species Results - 4000-acre Survey Area

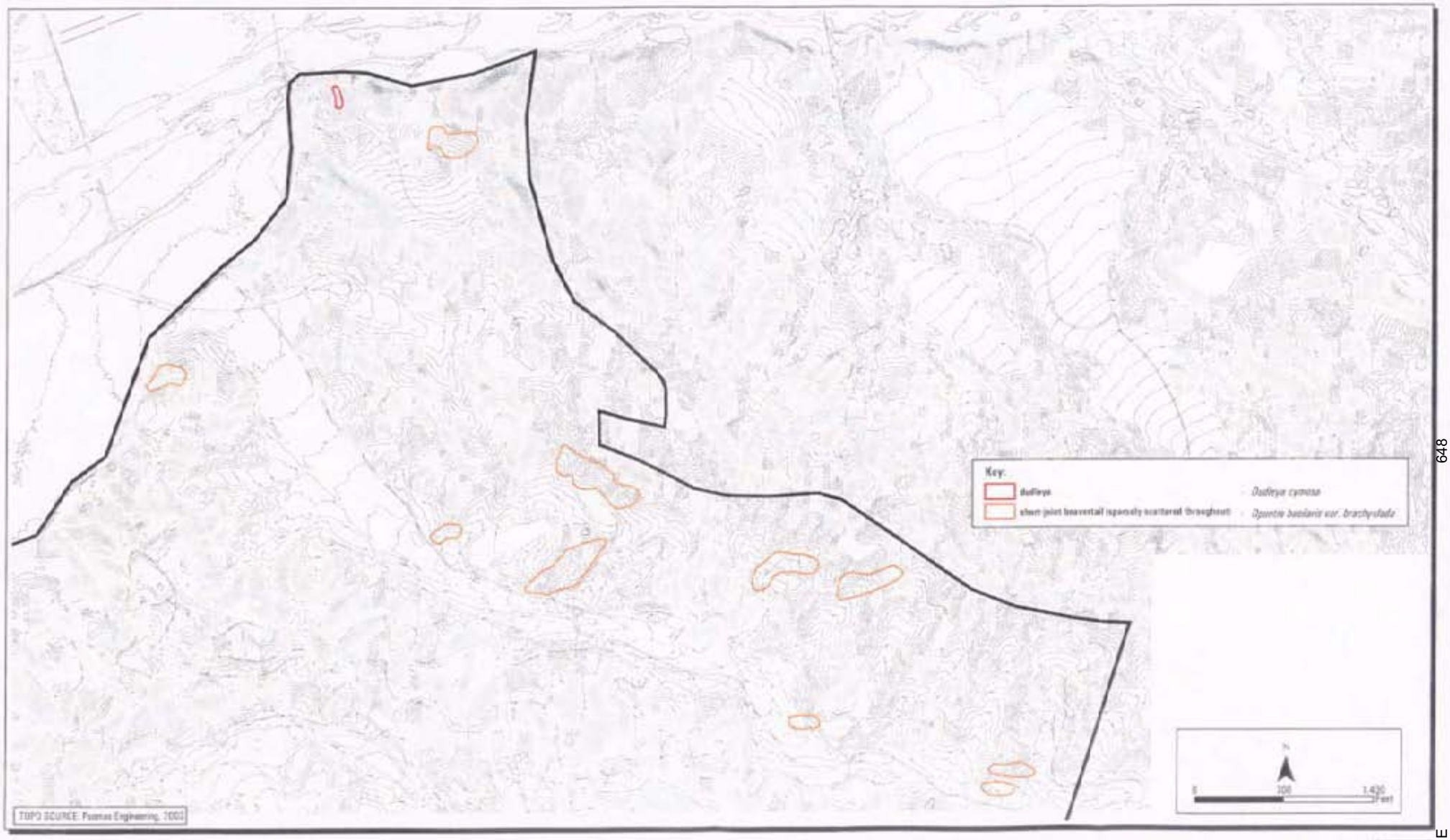
FIGURE 17



Newhall Ranch

2002 Sensitive Plant Species Results - 4000-acre Survey Area

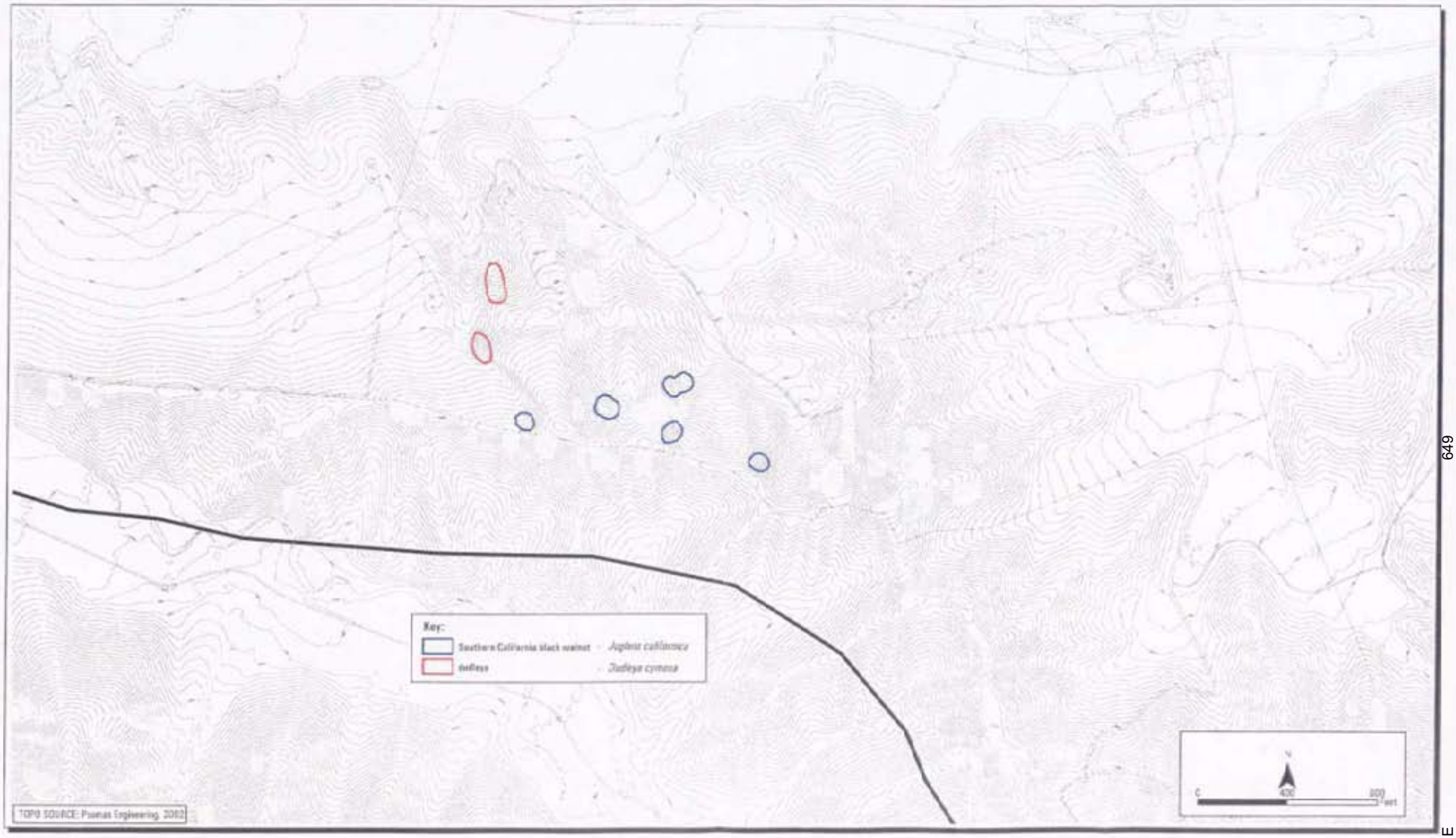
FIGURE 18



Newhall Ranch

2002 Sensitive Plant Species Results - 4000-acre Survey Area

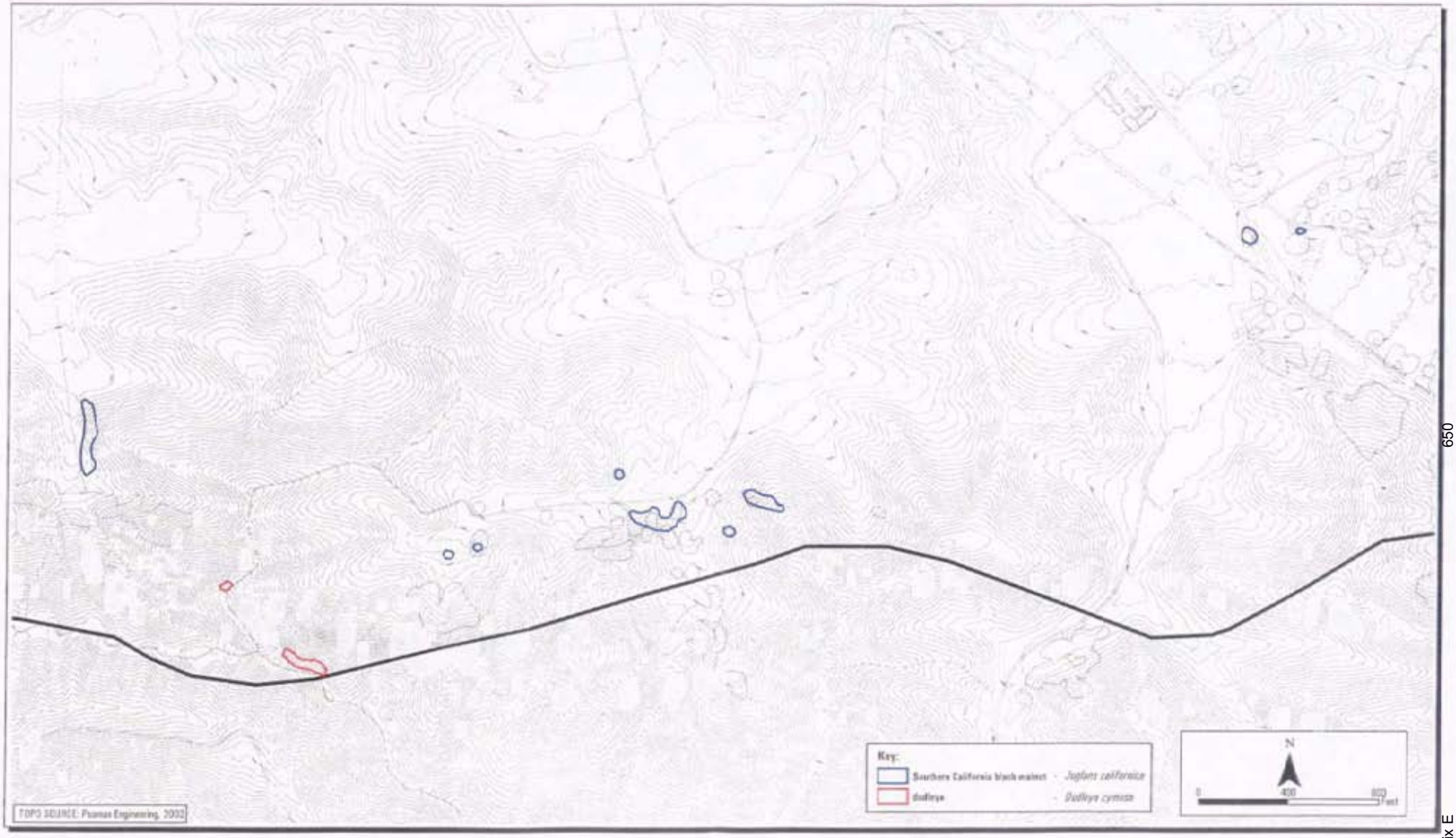
FIGURE 19



Newhall Ranch

2002 Sensitive Plant Species Results - 4000-acre Survey Area

FIGURE 20



Newhall Ranch

2002 Sensitive Plant Species Results - 4000-acre Survey Area

FIGURE 21

2002 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

TABLE 3
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Arenaria paludicola	marsh sandwort	FE/SE	1B	dense freshwater marsh/perennial herb/May-August	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout entire study area. No CNDDB records exist for the Newhall or Val Verde quads; nearest occurrence is in the Santa Ana River. Limited suitable habitat onsite; very low likelihood of occurrence within the study area.
Astragalus brauntonii	Braunton's milk-vetch	FE/None	1B	chaparral, coastal sage scrub, grasslands; often on carbonate substrates/perennial herb/March-July	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout entire study area. No CNDDB records exist for the Newhall or Val Verde quads; nearest occurrence is in the Simi Hills. Suitable habitat exists onsite. Moderate likelihood of occurrence within study area.
Atriplex coulteri	Coulter's saltbush	None/None	1B	coastal sage scrub and grasslands on alkaline or clay substrate/perennial herb/March-October	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout entire study area No CNDDB records exist for the Newhall or Val Verde quads; however, suitable habitat present onsite. Moderate likelihood of occurrence within study area.

2002 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

TABLE 3
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Atriplex serenana var. davidsonii	Davidson's saltscale	None/None	1B	coastal bluff scrub and coastal sage scrub on alkaline substrate/annual herb/May-October	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout entire study area. No CNDDB records exist for the Newhall or Val Verde quads. *Atriplex serenana var. serenana* observed onsite. Low likelihood of occurrence within the study area.
Baccharis malibuensis	Malibu baccharis	None/None	1B	chaparral, coastal sage scrub, cismontane woodland/deciduous shrub/August	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout entire study area. No CNDDB records exist for the Newhall or Val Verde quads; closest known populations in the western Santa Monica Mountains near Malibu. Not expected to occur within the study area.
Berberis nevinii	Nevin's barberry	FE/SE	1B	chaparral, coastal sage scrub, riparian scrub, cismontane woodland on sandy or gravelly substrate/evergreen shrub/March-April	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout entire study area. CNDDB records exist for San Francisquito Canyon at confluence with Santa Clara River; suitable habitat present onsite. Moderate likelihood of occurrence within study area.

2002 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

TABLE 3
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Brodiaea filifolia	Thread-leaved brodiaea	FT/SE	1B	clay substrate openings in chaparral, sage scrub, and grasslands/perennial herb (geophyte)/March-June	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout entire study area. No CNDDB records exist for the Newhall or Val Verde quads; nearest occurrence is in San Dimas. Suitable habitat present onsite. Low likelihood of occurrence within study area.
Calochortus clavatus var. clavatus	club-haired mariposa lily	None/None	4	chaparral and coastal sage scrub/ perennial herb (geophyte)/March-May	No CNDDB records exist for Newhall and Val Verde quads. Unidentified *Calochortus clavatus* subspecies observed in the 1,500-acre survey area. Need current year flowers to determine. Moderate to high likelihood of occurrence in study area.
Calochortus clavatus var. gracilis	slender mariposa lily	None/None	1B	chaparral and coastal sage scrub/perennial herb (geophyte)/March-May	CNDDB records for mouth of Pico Canyon. Unidentified *Calochortus clavatus* subspecies observed in the 1,500-acre survey area. Need current year flowers to determine. Moderate to high likelihood of occurrence in study area.
Calochortus plummerae	Plummer's mariposa lily	None/None	1B	chaparral, coastal sage scrub, cismontane woodland, grasslands on rocky granitic substrate/perennial herb (geophyte)/May-July	Not observed within study area during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area No CNDDB records exist for the Newhall or Val Verde quads; however, records exist for the Santa Susana Mountains and Simi Hills. Suitable habitat exists onsite. High likelihood of occurrence within study area.

2002 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

TABLE 3
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Calochortus weedii var. vestus	late-flowered mariposa lily	None/None	1B	chaparral, cismontane & riparian woodland/perennial herb (geophyte)/ June-August	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads; however, habitat similar to where species occurs in eastern Ventura County is present onsite. Moderate likelihood of occurrence within study area.
Calystegia peirsonii	Peirson's morning-glory	None/None	4	chaparral, coastal sage scrub, cismontane woodland, grassland/ perennial herb/May-June	Observed in chaparral and Venturan sage scrub throughout the survey area.
Calystegia sepium ssp. binghamiae	Santa Barbara morning-glory	None/None	1A	marshes and swamps/perennial herb/ April-May	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads; however, limited suitable habitat present onsite. Low likelihood of occurrence within study area.
Centromadia [=Hemizonia] parryi ssp. australis	southern tarplant	None/None	1B	mesic edges of marshes in grasslands/annual herb/May-November	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads; however, suitable habitat present onsite. Low likelihood of occurrence within study area.

2002 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

TABLE 3
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Cercocarpus betuloides var. blancheae	island mountain-mahogany	None/None	4	chaparral, closed-cone coniferous forest/evergreen shrub/February-May	Observed in mixed chaparral in the study area.
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower	FC/SE	1B	Coastal sage scrub, sandy soils/annual herb/April-June	Observed in three general areas within the survey area: Grapevine Mesa, Airport Mesa, and San Martinez Grande Canyon.
Deinandra [=Hemizonia] minthornii	Santa Susana tarplant	None/SR	1B	chaparral and coastal sage scrub on rocky substrate/deciduous shrub/July-November	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads; however, records exist for the Simi Hills and Oat Mountain. Suitable habitat exists onsite. Moderate likelihood of occurrence within study area.
Dodecahema leptoceras	slender-horned spineflower	FE/SE	1B	alluvial scrub on sandy substrate/annual herb/April-June	Not observed during 2002 field season; however, Santa Clara River bottom excluded from survey area. Historic CNDDB records exist for the Newhall or Val Verde quads in alluvial habitat similar to those present onsite. Moderate likelihood of occurrence within study area.
Dudleya blochmaniae var. blochmaniae	Blochman's dudleya	None/None	1B	clay openings in chaparral and coastal sage scrub, grasslands/perennial herb/April-June	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads. Suitable habitat present onsite. Low likelihood of occurrence within study area.

2002 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

TABLE 3
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Dudleya cymosa ssp. marcescens	marcescent dudleya	FT/CR	1B	chaparral, often on volcanic substrate/perennial herb (geophyte)/ April-June	No CNDDB records exist for Newhall and Val Verde quads. Unidentified *Dudleya cymosa* observed on vertical sandstone cliffs and slopewash throughout study area. Need current year flowers to determine.
Dudleya cymosa ssp. ovatifolia	Santa Monica Mountains dudleya	FT/None	1B	chaparral and coastal sage scrub, often on volcanic substrate/perennial herb (geophyte)/April-June	No CNDDB records exist for Newhall and Val Verde quads. Unidentified *Dudleya cymosa* observed on vertical sandstone cliffs and slopewash throughout study area. Need current year flowers to determine.
Dudleya multicaulis	Many-stemmed dudleya	None/None	1B	coastal bluff scrub, coastal sage scrub, valley and foothill grassland, rocky, often clay substrate/perennial herb/ April-June	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads; closest known occurrences are in Calabasas and San Dimas. Suitable habitat exists onsite. Moderate likelihood of occurrence within study area.
Dudleya parva	Conejo dudleya	FT/None	1B	coastal sage scrub and grassland on rocky, gravelly clays/perennial herb/May-June	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads. Suitable habitat exists onsite. Low likelihood of occurrence within study area.

2002 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

TABLE 3
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Erodium macrophyllum	round-leaved filaree	None/None	2	cismontane woodland and grasslands on clay substrate/annual herb/March-May	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads; however records exist for Simi Valley. Suitable habitat present onsite; moderate likelihood of occurrence in study area.
Helianthus nuttallii ssp. parishii	Los Angeles sunflower	None/None	1A	marshes and swamps/perennial herb/August-October	A *Helianthus* population, discovered in 2002 by Elvin and Sanders at Castaic Spring, on the south side of the Santa Clara River between Middle Canyon and San Jose Flats, was determined to be this species. The final determination of the identity of this species is still being worked on.
Horkelia cuneata var. puberula	Mesa horkelia	None/None	1B	chaparral, cismontane woodland, coastal sage scrub on sandy or gravelly substrate/perennial herb/February-December	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads. Suitable habitat present onsite. Low likelihood of occurrence within study area.
Juglans californica	southern California black walnut	None/None	4	chaparral, cismontane woodland, coastal sage scrub, alluvial scrub/deciduous tree/March-May	Observed in Venturan coastal sage scrub and chaparral onsite.

2002 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

TABLE 3
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Malacothamnus davidsonii	Davidson's bush mallow	None/None	1B	chaparral, coastal sage scrub, riparian woodland/ deciduous scrub/June-January	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. Nearest occurrences are in San Fernando and Sunland. Suitable habitat present onsite. Moderate likelihood of occurrence within study area.
Nama stenocarpum	mud nama	None/None	2	edges of lakes, rivers, ponds, vernal pools/annual/January-July	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. Moderate likelihood of occurrence on banks of Santa Clara River and other mesic areas onsite. No CNDDB records exist for the Newhall or Val Verde quads. Limited suitable habitat present onsite. Low likelihood of occurrence within study area.
Nolina cismontane	chaparral nolina	None/None	1B	chaparral, coastal sage scrub on sandstone or gabbro substrate/ perennial shrub/May-July	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads. Suitable habitat present onsite. Low likelihood of occurrence within study area.
Opuntia basilaris var. brachyclada	Short-joint beavertail	None/None	1B	chaparral, Joshua tree woodland, Mojavean desert scrub/succulent shrub/ April-June	Small groups observed in chaparral and coastal sage scrub throughout the site.

2002 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

TABLE 3
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Oxytheca parishii var. abramsii	Abram's oxytheca	None/None	1B	chaparral (sandy or shale)/June-August	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads; nearest occurrences are in the Topatopa Mountains. Suitable habitat present onsite. Moderate likelihood of occurrence within study area.
Pentachaeta lyonii	Lyon's pentachaeta	FE/SE	1B	openings in chaparral and coastal sage scrub, grasslands/annual herb/March-August	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads; nearest occurrences are in the Simi Valley. Suitable habitat present onsite. Moderate likelihood of occurrence within study area.
Rorippa gambelii	Gambel's watercress	FE/ST	1B	Marsh and swamps (freshwater and brackish)/ perennial herb/April-June	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads. Limited suitable habitat present onsite. Low likelihood of occurrence within study area.
Senecio aphanactis	rayless ragwort	None/None	2	chaparral, coastal sage scrub, cismontane woodland on alkaline substrate/annual herb/January-April	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. Historic CNDDB record for Saugus, south of Santa Clara River. Suitable habitat onsite. Moderate likelihood of occurrence within study area.

2002 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

TABLE 3
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Sidalcea neomexicana	Salt spring checkerbloom	None/None	2	chaparral, coastal sage scrub, and playas on alkaline substrate/perennial herb/March-June	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads; suitable habitat present onsite. Moderate likelihood of occurrence within study area.
Thelypteris puberula var. sonorensis	Sonoran maiden fern	None/None	2	meadows and seeps/perennial herb/ fertile January-September	Not observed during 2002 field season; however, all acreage not subject to similar level of survey effort for this species throughout study area. No CNDDB records exist for the Newhall or Val Verde quads; nearest occurrence at Point Dume. Limited suitable habitat present onsite. Low likelihood of occurrence within study area.

Legend

FE: Federally-listed as endangered
FT: Federally-listed as threatened
FC: Federal candidate for listing
SC: State candidate for listing
SE: State-listed as endangered
ST: State-listed as threatened
SR: State-listed as rare
CNPS List 1A: Plants presumed extinct in California
CNPS List 1B: Plants rare, threatened, or endangered in California and elsewhere
CNPS List 2: Plants rare, threatened, or endangered in California but more common elsewhere
CNPS List 3: Plants about which we need more information – a review list
CNPS List 4: Plants of limited distribution – a watch list

reproductive biology, dispersal). *Figures 5* through *11* contain labels for each of the polygons to correlate with *Tables 4, 5, 6*, and *7*, which contain estimates for the numbers of individuals within each polygon. To obtain these estimates, we either directly counted all individuals in a polygon or conducted a clumped counting and extrapolation method, which involved counting individual plants in small areas of a polygon, then extrapolating out over other areas of the polygon, until a total was obtained. Most of the polygon estimates were conducted by two botanists, independently, then compared for consistency.

Polygons for other sensitive species were mapped either with a GPS unit or by drawing polygons on 7.5-minute USGS quadrangle maps. Dudek used professional judgment to delineate these polygons based on the detectability of the species, topography, and vegetation. Information regarding the mapping for each sensitive species is included in the sections below (*Sections 4.2.1* through *4.2.8*).

TABLE 4
SFVS Estimates for the Airport Mesa Vicinity

Polygon Name	Plant Year	Estimate # Individuals	
		Minimum	Maximum
AM1	Pre-2002	150	350
AM10	Pre-2002	250	500
AM11	Pre-2002	10	3
AM13	Pre-2002	25	25
AM14	Pre-2002	25	25
AM15	Pre-2002	25	25
AM16	Pre-2002	2500	5000
AM17	Pre-2002	500	1,000
AM19	Pre-2002	250	500
AM19	Pre-2002	750	1,500
AM2	Pre-2002	1,000	1,500
AM3	Pre-2002	50	100
AM4	Pre-2002	500	750
AM5	Pre-2002	5	5
AM6	Pre-2002	300	600
AM7	Pre-2002	500	750
AM8	Pre-2002	6,500	10,000
AM9	Pre-2002	6,000	8,750
AM20	2002	1	1
AM21	2002	10	25
AM22	2002	1	1
AM23	2002	1	1
AM24	2002	2	2
AM25	2002	2	2
AM26	2002	4	4
AM27	2002	2	2
AM28	2002	3	3
AM29	2002	7	7

TABLE 4
SFVS Estimates for the Airport Mesa Vicinity

Polygon Name	Plant Year	Estimate # Individuals	
		Minimum	Maximum
AM30	2002	1	1
AM31	2002	40	50
AM32	2002	6	6
AM33	2002	11	11
AM34	2002	8	8
AM35	2002	2	2
AM36	2002	1	1
AM37	2002	1	1
AM38	2002	1	1
AM39	2002	9	9
AM40	2002	1	1
AM41	2002	11	11
AM42	2002	3	3
AM43	2002	4	4
AM44	2002	3	3
AM45	2002	1	1
AM46	2002	1	1
AM47	2002	4	4
AM48	2002	7	7
AM49	2002	159	159
AM50	2002	10	25
AM51	2002	50	100
AM52	2002	2	2
AM53	2002	1	1
AM54	2002	2	2
AM55	2002	1	1

TABLE 5
SFVS Estimates for the Grapevine Mesa Vicinity

Polygon Name	Plant Year	Estimate # Individuals	
		Minimum	Maximum
GM1	Pre-2002	1,000	1,000
GM10	Pre-2002	3,000	20,000
GM11	Pre-2002	3,000	5,000
GM12	Pre-2002	500	900
GM13	Pre-2002	2,000	4,000
GM14	Pre-2002	500	1,000
GM15	Pre-2002	75,000	250,000
GM16	Pre-2002	5,000	10,000
GM17	Pre-2002	500	1,000
GM18	Pre-2002	100	200
GM19	Pre-2002	250	500
GM2	Pre-2002	1,000	1,000
GM20	Pre-2002	3,000	5,000
GM21	Pre-2002	15,000	30,000

TABLE 5
SFVS Estimates for the Grapevine Mesa Vicinity

Polygon Name	Plant Year	Estimate # Individuals	
		Minimum	Maximum
GM22	Pre-2002	400	600
GM23	Pre-2002	500	700
GM24	Pre-2002	500	500
GM25	Pre-2002	20	50
GM26	Pre-2002	2,000	3,000
GM27	Pre-2002	500	500
GM28	Pre-2002	5,000	20,000
GM29	Pre-2002	200	500
GM3	Pre-2002	250	350
GM4	Pre-2002	50	50
GM5	Pre-2002	1,200	1,200
GM6	Pre-2002	10,000	15,000
GM7	Pre-2002	50	100
GM8	Pre-2002	100	200
GM9	Pre-2002	500	500
GM30	2002	50	50
GM31	2002	20	25
GM32	2002	25	50
GM33	2002	300	300
GM34	2002	3,000	5,000
GM35	2002	10	10
GM36	2002	100	150
GM37	2002	250	500
GM38	2002	420	420
GM39	2002	650	750
GM40	2002	1	1

TABLE 6
SFVS Estimates for the San Martinez Grande Canyon Vicinity

Polygon Name	Plant Year	Estimate # Individuals	
		Minimum	Maximum
SM1	2002	50	75
SM2	Pre-2002	950,000	1,250,000
SM3	Pre-2002	50,000	100,000
SM4	Pre-2002	200	500

TABLE 7
SFVS Estimate Totals

Polygon Name	Plant Year	Estimate # Individuals	
		Minimum	Maximum
Airport Mesa	Pre-2002	19,343	31,393
Airport Mesa	2002	373	463
Grapevine Mesa	Pre-2002	131,120	371,751
Grapevine Mesa	2002	4,826	7,256
San Martinez Grande Canyon	Pre-2002	1,000,200	1,350,500
San Martinez Grande Canyon	2002	50	75

4.2.1 *Calochortus clavatus* (mariposa lily)

One of the mariposa lilies observed within the study area was identified to species level from parts still in evidence from a previous year (*i.e.*, capsule, bulb coat). It is likely that it is one of two varieties: *Calochortus clavatus* var. *clavatus* (club-haired mariposa lily) or *C. clavatus* var. *gracilis* (slender mariposa lily). *Calochortus clavatus* var. *gracilis* is found on List 1B of the CNPS Inventory and *C. clavatus* var. *clavatus* is found on List 4 of the CNPS. Slender mariposa lily has been documented to occur at the mouth of Pico Canyon and other canyons in the vicinity (Newhall Quad; CNDDB 2002). Both varieties are typically found in chaparral, coastal scrub, and grasslands, often on clay, and/or rocky soils. The club-haired mariposa lily is usually found on serpentine soils.

Within the 4,000-acre study area, the unidentifiable variety of *Calochortus clavatus* found by DUDEK occurs on ridges and slopes in Venturan coastal sage scrub and grasslands, most often north of SR-126 (see *Figures 12* and *13*). The likelihood is greater that it is the slender mariposa lily, due to its presence within nearby habitat and the plant stalks were generally smaller in habit than the larger club-haired mariposa lily. Focused surveys were not conducted in the 4,000-acre study area for this species. DUDEK mapped *C. Clavatus* either with a GPS unit or by drawing polygons on USGS 7.5-minute quadrangle maps or aerial photography with topographic contours printed at a 1 inch = 200 feet scale. Discontinuous groupings of *Calochortus* plants were mapped as discrete/separate polygons. *Calochortus* plants were randomly scattered within these polygons. *Calochortus* varied in densities within and among the different locations/polygons from widely scattered to dense clusters. Population sizes were not determined for each location. CNDDB forms were not completed for this species because we were not able to determine which taxon, *Calochortus clavatus* var. *clavatus* or *C. clavatus* var. *gracilis*, is present due to the lack of flowering material.

4.2.2 *Calystegia peirsonii* (Peirson's morning glory)

Peirson's morning-glory has no state or federal status, but is found on List 4 of the CNPS *Inventory*. This morning-glory is rhizomatous perennial that typically is found in more desert-like areas (*e.g.*, creosote bush scrub, Joshua tree woodland) at elevations which exceed 3,000 feet AMSL, although there are records in the CNDDB for lower elevations in the local area. It was RECON's opinion (1996) that chaparral morning-glory (*Calystegia macrostegia* ssp. *cyclostegia*) was the more common species; however, after reviewing the floral bracts, leaf shape, and its glabrous nature, it is DUDEK's opinion that the morning-glory observed in the study area is Peirson's morning-glory. This species was also recorded onsite during limited focused surveys for sensitive plant species conducted in 1992 (Dames and Moore 1993).

While never abundant, Peirson's morning-glory is widespread onsite and was observed on virtually all ridges and slopes, weakly climbing over mixed chaparral, Venturan coastal sage scrub, and in grasslands throughout the 1,500-acre study area. It also occurs within the 4,000-acre study site, although it was not the subject of focused surveys. Due to the widespread nature of Peirson's morning-glory at Newhall Ranch, it is not specifically depicted on the report figures. CNDDB forms were not completed for this species because of the widespread and sparse nature of its distribution onsite and the relatively low sensitivity of this species.

4.2.3 *Cercocarpus betuloides* var. *blancheae* (island mountain-mahogany)

Island mountain-mahogany has no state or federal status, but is found on List 4 of the CNPS *Inventory*. It is an evergreen shrub that occurs as part of the chaparral in Los Angeles and Ventura counties, as well as on several of the Channel Islands (CNPS 2001). This species was not observed during limited focused surveys for sensitive plant species conducted in 1992 (Dames and Moore 1993) or general botany surveys conducted in 1995 (RECON and Impact Sciences 1996).

Onsite, island mountain-mahogany occurs as an occasional component of chaparral at the base of north-facing slopes in the 1,500-acre survey area (see *Figures 8* and *10*). Focused surveys were not conducted in the 4,000-acre study area for this species. DUDEK mapped *Cercocarpus betuloides var. blancheae* locations by drawing polygons on USGS 7.5-minute quadrangle maps or aerial photography with topographic contours printed at a 1 inch = 200 feet scale. Discontinuous *Cercocarpus* groupings were mapped as discrete/separate polygons. *Cercocarpus* polygons typically represent the canopy cover of an undetermined

number of individuals._CNDDB forms were not completed for this species because of the relatively low sensitivity of this species.

4.2.4 *Chorizanthe parryi* var. *fernandina* (San Fernando Valley spineflower)

San Fernando Valley spineflower is state-listed as endangered, a candidate for federal listing, and found on List 1B of the CNPS *Inventory*. Until its rediscovery in 1999 at Laskey Mesa on Ahmanson Ranch in Ventura County, it was thought to be extinct. A review of information of historic occurrence of SFVS in the CNDDB indicate that it was previously thought to occur in sandy to gravelly soils of washes, riverbeds, and upland areas primarily on the margins of the San Fernando Valley at the base of the Santa Susana Mountains, San Gabriel Mountains, and the Simi Hills. Munz (1974) provides distribution information to include Orange and San Diego counties. SFVS was not observed onsite during limited focused surveys for sensitive plant species conducted in 1992 (Dames and Moore 1993) or general botany surveys conducted in 1995 (RECON and Impact Sciences 1996).

Populations of SFVS were identified in three areas of the study area for the Newhall Ranch Specific Plan. Two of these are located south of SR-126 in the vicinities of Grapevine and Airport mesas, and the third is located north of SR-126 in San Martinez Grande Canyon. These locations are depicted on *Figures 4, 5,* and *6*, along with the distribution of observed polygons of SFVS within the generalized areas. While surveying in the field and mapping SFVS, DUDEK used a 4-meter (13.1 feet) rule to separate polygons. We chose this distance based on the topography, vegetation, detectability of the plants, general accuracy of the GPS that we used, and time constraints. This distance does not have any known relevance to SFVS biology (*i.e.*, reproductive biology, dispersal). *Figures x, y,* and *z* contain labels for each of the polygons to correlate with *Tables 4, 5, 6,* and *7*, which contain estimates for the numbers of individuals within each polygon. To obtain these estimates, we either directly counted all individuals in a polygon or conducted a clumped counting and extrapolation method, which involved counting individual plants in small areas of a polygon, then extrapolating out over other areas of the polygon, until a total was obtained. Most of the polygon estimates were conducted by two botanists, independently, then compared for consistency. For the Airport Mesa vicinity, we estimated that there were approximately between 373 and 463 individual plants from the 2002 cohort and between 19,343 and 31,393 individual plants from the pre-2002 cohort. For the Grapevine Mesa vicinity, we estimated that there were between 4,826 and 7,256 individual plants from the 2002 cohort and between 131,120 and 371,751 individual plants from the pre-2002 cohort. For the San Martinez Grande Canyon vicinity, we estimated that there were between 50 and 75 individual plants from the 2002 cohort

and between 1,000,200 and 1,350,500 individual plants from the pre-2002 cohort. Approximately 99.5 percent of the SFVS observed during DUDEK's 2002 surveys were the remnants of pre-2002 plants indicating that the germination and flowering of this species was very poor in 2002.

Most of the SFVS were found on slopes with a south-facing component in habitat that was either open Venturan coastal sage scrub, ecotone between Venturan coastal sage scrub and grasslands, or at the edge of agricultural fields on mesas. Nearly all of the observed SFVS were found on soils mapped by the USDA (1969) as slightly eroded to eroded Castaic-Balcom silty clay loam (30-50 percent slopes) or Terrace Escarpments. Plants in the vicinities of Grapevine and Airport mesas were observed down slope of terrace surfaces capped by Zamora clay loam (2-9 percent slopes). Elevations at SFVS locations onsite range from approximately 1,000 to 1,300 feet AMSL. CNDDB forms are included in *Appendix C*.

4.2.5 *Dudleya cymosa* (dudleya)

An unidentifiable subspecies of *Dudleya cymosa* was found at numerous locations within the study area (see *Figures 8, 10, 12, 14, 15* and *16*). These plants could not be identified to subspecies level due to their current condition after this record dry year. The poor material from this year keyed, with difficulty, to *Dudleya cymosa* ssp. *marcescens* (federally listed as threatened and state listed as rare); however, positive identification is not possible at this time. This dudleya could be one of the several *Dudleya* taxa known from the area, such as *D. cymosa* ssp. *ovatifolia* (federally listed as threatened) or it could also be a new species that has not been described. The locations of the dudleya are noted and should be checked in the future in order to make a positive identification. Population sizes were not determined for each location, but were estimated to generally range between 10-50 (100) individuals. DUDEK mapped *Dudleya cymosa* locations by drawing polygons on USGS 7.5-minute quadrangle maps or aerial photography with topographic contours printed at a 1 inch = 200 feet scale. Discontinuous *Dudleya cymosa* groupings were mapped as discrete/separate polygons. CNDDB forms were not completed for this species because the precise taxon has not been determined yet.

4.2.6 *Helianthus nuttallii* ssp. *parishii* (Los Angeles sunflower)

The Los Angeles sunflower was last seen in 1937 and had been thought to be extinct since that time (CNPS 2001). It is currently a CNPS list 1A plant with no state or federal status. Historic information indicates that this sunflower was only known to occur at five locations in Los Angeles, Orange, and San Bernardino counties (CNPS 2001, CNDDB

2002, and RSA). Los Angeles sunflower is considered to have been extirpated from each of these sites.

On June 25, 2002, DUDEK botanist Mark A. Elvin, accompanied by Andrew C. Sanders (UCR), discovered vegetative plants growing in a seep area south of the Santa Clara River between Middle Canyon and San Jose Flats (see *Figure 9*). Periodic checks were conducted to obtain flowers, which are necessary to confirm the identity of this taxon. Once the plants began to flower in the last week of August 2002, Elvin and Sanders identified the plants as Los Angeles sunflower. A specimen was collected independently by a representative of The Newhall Ranch Land and Farming Company and sent to the Herbarium at the University of California, Berkeley, where it was subsequently determined to be consistent with the taxon known as the Los Angeles sunflower by Dr. John Strother (Barbara Errter, memo to Ken Koch; September 12, 2002). This specimen, along with others, were sent to Drs. Loren Rieseberg and Charles Heiser at the University of Indiana, Bloomington and were identified as *Helianthus nuttallii ssp. nuttallii*. Work is currently ongoing to verify the identity of this plant.

The population of Los Angeles sunflower occurs on the edge of a slight rise in the middle of a one-acre spring/marsh complex ("Castaic Spring") that drains into the south side of the Santa Clara River just upstream of its confluence with Castaic Creek. This rhizomatous perennial grows to a height of up to sixteen feet and there appears to be three to five clumps of this species. The sunflower inflorescences are taller than the adjacent vegetation and remain in the sun throughout most of the day. Within these groups, there appear to be multiple individuals based on observed differences in leaf and bract lengths, widths, shape, and hairiness (Elvin and Sanders, pers. obs. 2002). Sanders estimated that there are more than 300 flower stems (see attached CNDDB form, *Appendix C*). Honey bees, cabbage white butterflies, and damsel flies have been observed visiting the flowers (Elvin and Weigand, DUDEK, pers. obs. 2002). The ground was cool and completely wet in September of the driest year in recorded history; therefore, the area is likely to be wet all year long. A CNDDB form is included in *Appendix C*. DUDEK mapped a minimum convex polygon around all of the sunflower clumps using a Trimble GeoExplorer 3 GPS unit. Focused surveys were not conducted in the 4,000-acre study area for this species.

4.2.7 *Juglans californica* (southern California black walnut)

Southern California black walnut has no state or federal status, but is found on List 4 of the CNPS *Inventory*. Within its distributional range in southern California, this species is found as scattered occurrences throughout chaparral, cismontane woodlands, and coastal and alluvial scrub habitats (CNPS 2001). Southern California walnut was not observed

during limited focused sensitive plant surveys conducted in 1992 (Dames and Moore 1993) or general botany surveys conducted in 1995 (RECON and Impact Sciences 1996).

This large shrub to tree was incidentally observed as an occasional component of mixed chaparral, Venturan coastal sage scrub, and alluvial scrub primarily along the north slope of the ridge between Potrero Canyon and Graves/Salt Creek Canyons (see *Figures 13, 15,* and *16*). Focused surveys were not conducted in the 4,000-acre study area for this species. DUDEK mapped *Juglans californica* locations with a Trimble Geo Explorer 3 GPS unit or by drawing polygons on USGS 7.5-minute quadrangle maps or aerial photography with topographic contours printed at a 1 inch = 200 feet scale. *Juglans* polygons typically represent the canopy cover of an undetermined number of individuals. Some polygons represent one tree and some represent multiple trees (up to twenty). Discontinuous *Juglans californica* groupings were mapped as discrete/separate polygons. CNDDB forms were not completed for this species because of the relatively low sensitivity of this species.

4.2.8 *Opuntia basilaris* var. *brachyclada* (short-joint beavertail)

Short-joint beavertail has no state or federal status but is found on List 1B of the CNPS *Inventory*. Throughout its range, it is found in a variety of scrub and woodland habitats on the north side of the Transverse Range along the edge of the Mojave Desert. The beavertail cactus identified within the study area keys to *Opuntia basilaris* var. *brachyclada* in *The Jepson Manual* (Hickman 1993), which identifies pad lengths as more than twice as long as their width. Pads on the observed beavertail cactus in the study area range in length from 3-15 inches, which was considerably longer than the pad width of 1-4 inches. It should be noted that in the past, beavertail cactus in the Newhall area that were of this size were ascribed to *O. basilaris* var. *ramosa;* however, this variety was subsumed into variety *O. basilaris* var. *brachyclada* in *The Jepson Manual* (Hickman 1993). Further attention is likely warranted to determine the taxonomic classification of the beavertail cactus at Newhall Ranch.

Within the study area, short-joint beavertail was observed in sparsely scattered clumps/patches on ridges, slopes, and in alluvial areas. DUDEK mapped these locations by drawing polygons on USGS 7.5-minute quadrangle maps or aerial photography with topographic contours printed at a 1 inch = 200 feet scale or occasionally with a Trimble Geo Explorer 3 GPS unit. Discontinuous beavertail groupings were mapped as discrete/separate polygons. The polygons depicting the distribution of short-joint beavertail (see *Figures 8, 9, 10, 12,* and *14*) represent single to multiple (~25-50) individuals, regardless of the size of the polygon.

It should also be noted that a few beavertail clumps were found in Long Canyon that were problematic in terms of identification. These plants appear to be some form of *Opuntia basilaris*, possibly a hybrid or mutant. Some of the plants have spines in the areoles, which is a characteristic of *Opuntia basilaris* var. *treleasei* (Bakersfield cactus), a state and federally listed taxon. Focused surveys were not conducted in the 4,000-acre study area for *Opuntia basilaris*. CNDDB forms are included in Appendix C.

5.0 ACKNOWLEDGMENTS

Mark A. Elvin and Julie M. Vanderwier prepared this report, with review by Sherri L. Miller, Philip R. Behrends Ph.D., and staff at The Newhall Land and Farming Company. Mark McGinnis provided graphics and GIS mapping analyses. Tonette S. Foster provided word processing.

6.0 LITERATURE CITED

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APPENDIX A

RESUMES OF SURVEY PERSONNEL

MICHELLE L. BALK
Environmental Specialist

EDUCATION / REGISTRATION

- University of Akron
  M.S., Biology with emphasis Ecology and Evolution, 1999

- Iowa State University
  B.S., Zoology, 1997

PROFESSIONAL CERTIFICATIONS

- Quino Checkerspot Butterfly 10a Survey Permit
  (USFWS Federal Permit)

EXPERIENCE SUMMARY

Ms. Balk has over a year of experience in environmental document preparation and resource conservation planning. Project experience includes biological resource surveys, data collection and analysis, environmental assessments, wetland delineations, permitting, mitigation design and monitoring, and endangered species surveys. Ms. Balk has engaged in interagency coordination and public outreach efforts due to the complexities of each project. Ms. Balk has also participated in the development of habitat conservation plans pursuant to Section 10 of the Federal Endangered Species Act.

PROFESSIONAL ASSIGNMENTS

- **Residential Development**. Irvine, California. Assisted in USFWS protocol surveys for the Coastal California Gnatcatcher.

- **Conservation Planning**. Assisted in the development of the MSHCP for western Riverside County. Project involvement included reserve design, document preparation, interagency coordination and public outreach.

- **Residential Development**. Riverside County, California. Conducted wetland delineation and prepared permit applications for 51-unit housing development.

- **Public University Student Housing Project**. San Marcos, California. Conducted vegetation mapping and wetland delineation, prepared permit applications, and coordinated with resource agencies for student housing project.

- **Residential Development**. Rancho Santa Fe, California. Performed environmental assessments and prepared encroachment permit applications for open space encroachments.

- **Creek Maintenance Project**. Poway, California. Performed wetland delineation and vegetation mapping for creek maintenance project.

- **Sewer Realignment**. Carlsbad, California. Assisted in the wetland delineation and vegetation mapping for sewer realignment project.

- **Residential Developments**. Laguna Beach and Oxnard, California. Mapped vegetation, surveyed for sensitive plants, and wrote biological resources reports for residential developments.

- **Utility Pole Maintenance Project**. San Bernardino Mountains, California. Conducted botanical surveys and surveyed for sensitive plants at pole replacement locations.

- **Salt Marsh Restoration Project**. San Diego, California. Performed vegetation mapping and prepared biological resources report for marsh restoration project.

- **Focused Botanical Survey**. Newhall Ranch, Los Angeles County, California. As team botanist, performed focused survey for San Fernando Valley spineflower on a 6,000-acre project site.

PUBLICATIONS

- "Phenotypic effects of leptin in an ectotherm: a new tool to study the evolution of life histories and endothermy?", with P.H. Niewiarowski and R.L. Londraville. The Journal of Experimental Biology 203:295-300, 2000.

- "Sprint speed variation in hatchling fence lizards as a function of ontogenetic stage and population," with P.H. Niewiarowski and J.M. Engelhardt. In preparation.

- "Phylogenetic Analysis of Reaction Norm Evolution in North American Softshell Turtles," with F.J. Janzen. In preparation.

RELEVANT EXPERIENCE

- Volunteer, Project Wildlife, San Diego, CA. Cared for injured wildlife and reared baby birds at wildlife rescue organization.

- "Sunday Birds" field ornithology course with San Dieguito Adult School, Encinitas, CA.

SCOTT BOCZKIEWICZ
BIOLOGIST/ENVIRONMENTAL SPECIALIST

EDUCATION

- B.S. / 1994 / Biological Conservation
- B.F.A. / 1994 / Painting and Drawing

PROFESSIONAL AFFILIATIONS

- Member of the Society for Wetland Scientists
- Member of the Society for Conservation Biology
- Member of the Society for Ecological Restoration

EXPERIENCE SUMMARY

Scott has a diverse range of work experience in the biological sciences, with emphasis in conservation biology, wetland science, and restoration ecology. He has experience in many ecosystems including riparian, wetland, grassland, prairie, desert, and montane forested areas. Scott has progressive experience evaluating impacts to sensitive, rare, threatened and endangered plant and wildlife species in Southern California. He has conducted sensitive species assessments, biological resource inventories, vegetation mapping, and wetland delineations for large public and private land holdings, and also has experience conducting focused surveys for botanical and wildlife species. Scott conducts biological monitoring of construction and infrastructure maintenance projects occurring in environmentally sensitive and/or protected areas throughout San Diego and Orange County. Scott has produced assessments of wetlands and uplands to support management plans and planning studies, designed mitigation plans and habitat restoration and monitoring plans for riparian, wetland, and upland habitats, identified regulatory issues for development and infrastructure projects to guide project designs, and completed permit applications supporting project compliance with federal, state, and local environmental regulations.

PROFESSIONAL ASSIGNMENTS

- **SR-56 Wetlands Mitigation and Environmental Permitting - San Diego, CA.**
  Provided mitigation site analysis including an HGM-based wetland assessment and designed a conceptual wetland creation and enhancement plan to mitigate impacts to jurisdictional wetlands resulting from construction of State Route 56 (SR-56). The 25-acre El Cuervo Norte riparian creation and enhancement project will occur in the west end of the Los Peñasquitos Canyon Preserve beginning in March of 2003. Secured an ACOE 404 Individual Permit, USFWS Take Authorization for least Bell's Vireo, RWQCB 401 Water Quality Certification, and CDFG 1601 Streambed Alteration Agreement for Phase 2 of SR-56 construction.

- **Biological Resource Surveys - Escondido Creek Conservancy, CA.** Conducted biological resources surveys and a wetland delineation to provide baseline biological site information supporting development of a long-term management plan for a 75-acre preserve property along Escondido Creek in unincorporated San Diego County.

- **Adobe Falls Supplemental Environmental Project - San Diego, CA.** Provided a biological resources assessment and designed a restoration plan including streambank erosion control for a 4-acre riparian wetland site along Alvarado Creek in San Diego. The restoration plan was designed to fit a predetermined budget amount of $310,000, and to meet all federal and state regulatory requirements.

- **Laborde Canyon OHV Park Study - Riverside, CA.** Assisted with herptile trap array installation and monitoring on a 2600 acre site in the badlands of western Riverside county. The data supported a biological constraints analysis for development of an Off Highway Vehicle Park.

- **Rare Plant Surveys - Newhall Ranch, Valencia, CA.** Assisted with focused rare plant surveys for San Fernando Valley Spine flower (*Chorizanthe parryi* var. *fernandina*) and a general botanical inventory on portions of Newhall Ranch.

- **Rare Plant Surveys - Great Oak Ranch, Western Riverside County, CA.** Assisted with rare plant surveys and a general botanical inventory of the San Diego Pipeline #6 alignment through the Great Oak Ranch.

- **Collier Marsh Wetland Delineation - Western Riverside County, CA.** Conducted a wetland delineation and plant inventory of Collier Marsh, a 50+ acre wetland site immediately north of Lake Elsinore in Riverside County.

MARK ELVIN
SENIOR BIOLOGIST/BOTANIST

EDUCATION

- University of California, Irvine
  M.S. Ecology and Evolutionary Biology, 1992

- University of North Carolina, Chapel Hill
  B.A. Biology and Philosophy, 1986

PROFESSIONAL CERTIFICATIONS

- California Department of Fish and Game State listed plants collecting permit

PROFESSIONAL AFFILIATIONS

- California Native Plant Society
- Southern California Botanists

EXPERIENCE SUMMARY

Mr. Elvin has 16 years experience as a biological resource specialist in southern California. As a Fish and Wildlife Biologist at the U.S. Fish and Wildlife Service (USFWS) he was responsible for conducting scientific reviews and analyses of species statuses for proposing and designating critical habitat within court ordered deadlines for listed fauna and flora; conducting scientific reviews and analyses of species statuses and developing recovery plans for listed species; and was the lead staff biologist for the USFWS for the implementation of the City of San Diego Multiple Species Conservation Plan (MSCP). In addition, he was the lead staff biologist at the USFWS for Quino checkerspot butterfly survey work conducted within San Diego County. Through his years of experience he has conducted sensitive species surveys in various habitat types throughout central and southern California including coastal strand, dune, coastal marsh, estuarine, coastal bluff scrub, coastal sage scrub, maritime succulent scrub, southern maritime chaparral, chaparral, valley grass lands, vernal pools, riparian scrub, riparian woodland, southern oak woodlands, alluvial fan sage scrub, montane coniferous forest, pebble plains, montane meadows, pinyon-juniper woodland, joshua tree woodland, sagebrush scrub, creosote bush scrub, alkali flats, desert mountains, creosote bush scrub, Mojavean desert scrub, and Sonoran desert scrub.

Mr. Elvin has also worked as a seed and conservation program coordinator, seed technologist, museum scientist, and conservation collection manager.

PROFESSIONAL ASSIGNMENTS

- Serves on the DUDEK project team preparing the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) that covers approximately 1.2 million acres. Mr. Elvin primarily is responsible for the adaptive management plan of the reserve system. Mr. Elvin also provides input on the sensitive plants component of the plan that addresses 59 plants, including 13 that are state and/or federally listed, and species monitoring studies.

- Conducted onsite ecological and biological investigations and surveys of complex development proposals to determine their effects on flora and fauna throughout southern California.

- Conducted field surveys for state and federally listed and MSCP-covered plant species for the City of San Diego's Multiple Species Conservation Program (MSCP).

- Conducted surveys for and collections of plants throughout Orange, San Diego, Riverside, San Bernardino, and Los Angeles counties and Baja California, Mexico.

- Conduct onsite ecological and biological investigations and surveys for threatened and endangered plant species throughout Los Angeles, Orange, San Diego, San Bernardino, Riverside, Imperial, Baja California (Mexico), Ventura, Monterey, San Benito, and San Luis Obispo counties.

- Participated in surveys for sensitive plants (including *Delphinium variegatum* ssp. *kinkiense* (San Clemente Island larkspur), *Lithophragma maximum* (San Clemente Island woodland star), *Lotus dendroideus* var. *traskiae* (San Clemente Island lotus), *Malacothamnus clementinus* (San Clemente Island bush mallow), *Sibara filifolia* (Santa Cruz Island rock cress)) on San Clemente and Santa Catalina Islands Los Angeles County.

Monitoring Programs

- Conducted demographic and ecological data collection surveys for the federally listed as threatened *Deinandra conjugens* (Otay tarplant) and the federally proposed as endangered *Ambrosia pumila* (San Diego ambrosia) and focused surveys for the federally listed as endangered Quino checkerspot butterfly (*Euphydryas editha quino*) in San Diego County for the MSCP.

Threatened and Endangered Species

- Conducted many surveys for State and/or federally listed plants in San Diego, Orange, Los Angeles, Riverside, and San Bernardino counties.

SELECTED PUBLICATIONS

Elvin, M. 2002. Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for Five Carbonate Plants From the San Bernardino Mountains in Southern California. 67 FR 6577.

Elvin, M. 2001. Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for Deinandra conjugens (Otay tarplant). 66 FR 32052.

Koopowitz, H., M. Elvin, and L. Keenan. (1996). In vivo visualization of living flatworm neurons using Lucifer Yellow intracellular injections. J. Neurosci. Meth. 69: 83-89.

Koopowitz, H., M. Elvin, and T. Bae. (1995). Comparison of the nervous system of the rhabdocoel, Mesostoma ehrenbergii, with that of the polyclad, Notoplana acticola. Hydrobiologia. 305: 127-133.

Elvin, M., H. Koopowitz (1994). Neuroanatomy of the rhabdocoel flatworm *Mesostoma ehrenbergii* (Focke, 1836) I: Neuronal diversity in the brain. J. Comp. Neurol. 343: 319-331.

MEGAN S. ENRIGHT
Environmental Analyst / Biologist

EDUCATION
- University of California, San Diego
  Bachelor's of Science in Biology-Ecology, Behavior and Evolution, 1997

PROFESSIONAL AFFILIATIONS
- Member, California Native Plant Society
- Member, Women's Environmental Council

EXPERIENCE SUMMARY

Ms. Enright is a biologist with five years experience in habitat restoration and biological assessments. She participated in coastal sage scrub restoration at the City of San Diego Miramar Landfill. The project included restoration design, native plant nursery management, and revegetation monitoring. Her current role at Dudek & Associates includes biological resources assessments and impact analyses, wetland delineations and permitting, vegetation mapping and rare plant surveys.

PROFESSIONAL ASSIGNMENTS

Wetlands Delineation, Wetlands Permitting and Biological Resources Reports

- **Transportation Corridor**. North County Transportation District - Oceanside to Escondido Rail Project, City of Oceanside, California. Delineated wetlands and prepared vegetation map within the Loma Alta Creek, Buena Vista Creek, Buena Creek, Agua Hedionda Creek, San Marcos Creek, and Escondido Creek Watersheds. Prepared Section 401 and Section 404 permit applications and 1601 Streambed Alteration Agreement for impacts to non-tidal, adjacent wetlands; impacts were associated with the rail system. Prepared alternatives analysis, functional values assessment, and Conceptual Wetlands Mitigation Plan. Assisted in the preparation of the biological resources report and CEQA documentation.

- **Roadway Corridor**. Camino Ruiz Road Alignment, San Diego-Future Urbanizing Area Subarea IV, California. Delineated wetlands, prepared vegetation map, and conducted rare plant surveys. Prepared Section 401 and Section 404 permit applications and 1603 Streambed Alteration Agreement for impacts to non-tidal, adjacent wetlands; impacts were associated with the roadway corridor. Prepared functional values assessment.

- **Roadway Improvements and Flood Protection Project.** City of San Marcos, California. Delineated wetlands, prepared vegetation map, and conducted rare plant surveys along San Marcos Creek from State Route 78 to Lake San Marcos.

- **Residential Subdivision.** The Irvine Company Planning Area 1, County of Orange, California. Prepared vegetation map and conducted rare plant surveys within the 4,000-acre project site. Prepared biological resources report for CEQA purposes.

- **Residential Subdivision and Commercial** Development. The Irvine Company Planning Areas 18 and 39, City of Irvine, California. Delineated wetlands and prepared vegetation map within the 1,200-acre project site. Developed wetlands permitting strategies with client.

- **Constraints Analyses**. Vista Unified School District, City of Vista and County of San Diego, California. Delineated wetlands and prepared vegetation map for three potential school sites. Other field

investigations included surveys for state- and federally-listed threatened or endangered plant and wildlife species. Field investigations were incorporated into reports discussing biological constraints on the three potential school sites.

- **Landfill Closure and Embankment and Scour Protection.** Kern Valley Sanitary Landfill Closure Project, Kern County, California. Delineated wetlands and prepared Section 401 and Section 404 Letter of Permission permit applications and 1601 Streambed Alteration Agreement for impacts to non-tidal, adjacent wetlands; impacts were associated with the embankment and scour protection. Prepared functional values assessment.

- **Dredging Impact Analysis**. Old Mission Dam, San Diego, California. Prepared wetland delineation and vegetation map upstream of the historic Old Mission Dam. Prepared biological resources report for CEQA purposes. Coordinated with regulatory agencies regarding proposed dredging.

- **Focused Rare Plant Surveys.** Newhall Ranch, Los Angeles County, California. Conducted focused surveys for the state-listed endangered San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina)* on approximately 6,000 acres.

Habitat Restoration and Enhancement

- Monitored salt marsh and riparian creation and enhancement efforts at Rancho Santa Fe Road Bridge, Sorrento Valley Utilities Improvement (City of San Diego, Tijuana River Emergency Channel Mitigation, Green Valley Mobile Home Park Slope Stabilization and North Metro Interceptor Sewer Projects in San Diego, California. Conducted data analysis to determine success of restoration and enhancement efforts in terms of predetermined performance standards. Prepared subsequent monitoring reports which included the assessment of revegetation efforts and recommendations for further remedial actions.

- Monitored upland vegetative communities including coastal sage scrub revegetation efforts at Top of the World Reservoir and Pump Station, Laguna Beach, California. Prepared subsequent monitoring reports.

- Prepared Conceptual Wetland Mitigation Plan for the Emergency Sewer Repairs at various sites along Escondido Creek and for the Hale Avenue Resource Recovery Facility (HARRF) for the City of Escondido, California. Prepared Conceptual Wetland Mitigation and Revegetation Plan for the Torrey Del Mar Project within the City of San Diego Future Urbanizing Area Subarea I, California.

- Prepared Conceptual Vernal Pool Mitigation Plan including restoration and enhancement for the Manzanita Partners Property in Carlsbad, California. Project included delineating existing vernal pools for enhancement and mapping historical vernal pools for restoration.

- Assisted in the research and documentation for mitigation alternatives for SR-125-Caltrans. Focused on mitigation through the restoration of habitat for the federally-endangered Quino Checkerspot Butterfly (*Euphydryas editha quino*).

Construction and Erosion Control Monitoring

- Performed construction monitoring for the Sorrento Valley Utilities Improvement Project which included precise grading for the restoration of salt marsh and other riparian habitats.

- Inspected the North Reservoir Project which includes erosion/sediment methods to verify the project was in accordance with the Storm Water Pollution Prevention Program for the Laguna Beach County Water District in the City of Laguna Beach, California. Project included weekly monitoring visits to assess the

function of the installed Best Management Practices for erosion control and subsequent observation reports, water quality sampling, and storm event monitoring.

Conservation Planning

- Assisted in the development of the Multiple Species Habitat Conservation Plan (MSHCP) for western Riverside County. Project involvement included research on potentially covered plant species followed by syntheses of ecological information.

PAUL LEMONS
Biologist

EDUCATION

- San Diego State University
  B.S. Biological Sciences, Emphasis in Ecology 2001

PROFESSIONAL CERTIFICATIONS

- Quino Checkerspot Butterfly Section 10(a)(1)(A) Recovery Permit
  (USFWS Federal Permit # TE051248-0)

EXPERIENCE SUMMARY

Mr. Lemons has a background in biology and environmental policy and regulation. As an undergraduate he worked as an intern at Mission Trails Regional Park in San Diego County. Paul assisted in the creation of a Habitat Conservation Plan for Mission Trails Regional Park in accordance with the City of San Diego and state guidelines.

Before working at Dudek and Associates, Inc. (DUDEK), Mr. Lemons worked as an intern for the San Diego Regional Water Quality Control Board where his duties included processing and review of Section 401 Water Quality Certification Applications and California Environmental Quality Act (CEQA) documents.

Since joining DUDEK, Mr. Lemons has been primarily involved with Biological monitoring and the preparation of Biological Technical Reports, Wetlands Mitigation and Monitoring Plans, and Environmental Permit Packages. Mr. Lemons was recently permitted to survey for the federally endangered Quino checkerspot butterfly, and will therefore be carrying out these surveys for future Dudek projects.

PROFESSIONAL ASSIGNMENTS

Mr. Lemons is currently providing monitoring, report writing, and/or support on the following projects:

- **University Commons Development Project, Biological monitoring, Carlsbad, CA.** Responsible for monitoring the clearing of native habitat to ensure clearing activities only occur within approved boundaries and that Best Management Practices are implemented.
- **Requeza Street Project, Encinitas, CA** Assisted in identifying plant species and mapping vegetation communities onsite.
- **Gordon Property, Vista, CA.** Project manager. Wrote Biological Constraints Analysis. Assisted with vegetation mapping and general wildlife surveys.
- **Torrey Ranch Project, San Diego, CA**. Responsible for preparation of the environmental permit package for this project. Prepared and submitted complete permit applications to the Regional Water Quality Control Board for section 401 Water Quality Certification, California Department of Fish and Game Section 1600 Streambed Alteration Agreement, and to the Army Corps of Engineers for Section 404.

- **Otay Ranch Village Two Biological Resources Report & Impact Analysis, Chula Vista, CA.** Conducted Quino checkerspot butterfly surveys within the project area.

Kim L. Marsden
4243 Copeland Avenue #3
San Diego, California 92105-1234
Phone (619) 563-6492

Kim L. Marsden

Botanist/Biologist

As a biologist with ten years of experience, Ms. Marsden has successfully conducted a diverse range of botanical and zoological surveys, including focused searches for rare and endangered species in coastal, mountain and desert plant communities. She has developed excellent botanical skills from not only a broad range of field identification experiences throughout the southwestern United States and northwestern Mexico, but training in botanical laboratory techniques used for plant identification, as well. Ms. Marsden has extensive experience in the analyses of potential impacts to species and habitats from proposed development projects. She prepares and reviews technical reports, which provide alternatives recommendations to mitigate these impacts. She has a thorough working knowledge of regulatory issues and applicable laws including the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), and the Clean Water Act as part of her resource agency experience working as a Botanist/Biologist for the California Department of Fish and Game, U.S. Fish and Wildlife Service, and through her project manager experience in the regulatory branch of the U. S. Army Corps of Engineers. Ms. Marsden has reviewed and commented on numerous proposed mitigation and monitoring plans for sensitive species. She is knowledgeable of, and skilled in, vegetation mapping, mitigation monitoring, and the design of habitat restoration plans. She also has extensive experience in conducting rare, threatened, and endangered animal surveys.

EDUCATION

Completed all required coursework for the Master's Program in Systematic Botany, San Diego State University, 1992-1994. Master's Research Topic: Systematics, ecology and natural history of Northwest American *Eryngium* species (Apiaceae).
Bachelor of Science, Biology, San Diego State University, 1992.
Associate of Science, Medical Laboratory Technology, San Diego Mesa College, 1988.

PUBLICATIONS

Marsden, Kim L. and Michael G. Simpson. 1999. *Eryngium pendletonensis* (Apiaceae), A New Species from Southern California. *Madroño*, 46:1, 61-64.

EXPERIENCE

1/01-present Associate Resource Ecologist, California Department of Parks and Recreation, Southern Service Center, San Diego.

Design long-term monitoring studies to assess the status and condition of vegetation communities, exotic species infestations, and rare plant populations. Conduct vegetation and rare plant inventories within State Parks in southern California. Assess the impacts of maintenance and development projects on biological resources within state park units. Provide technical botanical expertise to Service Center staff when requested. Assist in project environmental clearance under CEQA, ESA, and CESA. Assist other resources section staff in biological survey work and data analysis when necessary.

1/00 –1/01 Associate Biologist in Botany, California Department of Fish and Game, Region 5, San Diego Office.

Provided technical assistance in developing Habitat Conservation Plans to applicants/jurisdictions seeking take authorization under Section 2835 of the Fish and Game Code (Natural Community Conservation Program). Coordinated with the U.S. Fish and Wildlife Service Habitat Conservation Program staff to ensure HCP conformity with the Federal Endangered Species Act and the California Fish and Game code and other state and federal laws.

9/97-1/00 Fish and Wildlife Biologist/Botanist-U.S. Fish and Wildlife Service, Branch of Habitat Conservation Planning, Ecological Services, Carlsbad Field Office.

Provided technical assistance in developing Habitat Conservation Plans to applicants/jurisdictions seeking take authorization under section 10 of the Endangered Species Act. Coordinated with California Department of Fish and Game Natural Community Conservation Program (NCCP) staff to ensure HCP conformity with the Endangered Species Act and the Fish and Game code.

Evaluated and commented on projects impacting U.S. Army Corps of Engineers' jurisdictional Waters of the United States pursuant to the Fish and Wildlife Coordination Act. Consulted and conferred with other federal agencies under section 7 of the Endangered Species Act (Act) to analyze effects of federal actions on species proposed for listing or listed as endangered, threatened under the Act.

Provided technical expertise to Field Office staff in evaluation of revegetation, restoration and enhancement projects of upland, riparian, and wetland habitats. Provided general botanical expertise to Field Office staff biologists when needed.

7/96-9/97 Botanist-U.S. Fish and Wildlife Service-Branch of Federal Projects, Ecological Services, Carlsbad Field Office.

Conducted complete biological surveys for plants and wildlife for impact assessments of proposed land and water development projects. Prepared biological technical reports, including analyses of project alternatives developed from the results of directed sensitive species and community surveys. Developed sampling protocols for vegetation communities; provided botanical expertise to staff biologists and made recommendations for resource protection and enhancement. Surveyed for, and monitored the status of, federal candidate, proposed, and listed plant and animal taxa. Assisted in amphibian and reptile pit-fall trapping survey efforts. Provided technical expertise to Field Office staff biologists for evaluation of revegetation, restoration and enhancement efforts of upland, riparian, and wetland habitats.

11/95-7/96 Biologist/Project Manager, U. S. Army Corps of Engineers, Regulatory Branch, San Diego Field Office.

Project management, including evaluation of impacts to jurisdictional Waters of the United States, including wetlands, associated with permit requests pursuant to section 404 of the Clean Water Act, section 10 of the Rivers and Harbors Act, and section 103 of the Marine Sanctuaries Act. Processed permit applications, composed letters to applicants, evaluated compliance with permit conditions and coordinated with other agencies regarding proposed permit activities affecting biological, historical and water resources.

3/95-10/97 Botanist (Seasonal), Lake Cuyamaca Recreation and Park District, Julian, CA.

Project Manager of the Lake Cuyamaca downingia, Lake Cuyamaca larkspur, and Parish's meadowfoam monitoring program. Developed sampling and monitoring protocols for sensitive plant species. Coordinated rare plant monitoring activities in accordance with interagency Memorandum of Understanding guidelines, including mapping of rare plant populations using Geographic Information System (GIS) technology to assess annual boundary changes of plant subpopulations; prepared annual biological technical reports. Supervised and trained field personnel in established survey methodology; ensured thorough documentation of survey and monitoring activities through complete field notes.

4/94-10/94 Research Assistant II, San Diego State University Foundation; Contract biologist for U.S. Air Force, Luke Air Force Base, Gila Bend, Arizona. Small mammal monitoring (Dr. Lee McClenaghan).

Live-trapped small mammals, recorded life history data, tagged/marked animals, and recorded animal locations for home range determination. This project assessed the effects of low-altitude jet noise on predator-prey (kit foxes/rodents) relationships in a desert scrub community.

4/94-12/94 Environmental Services Intern, California Department of Parks and Recreation, Southern Service Center, San Diego, CA

Performed vegetation sampling, and conducted reptile, bird (including least Bell's vireo), and small mammal surveys for incorporation into a GIS database for the Anza Borrego Desert State Park General Plan. Developed sampling protocols for sensitive plant species; mapped vegetation, evaluated plant community composition and classified vegetation types according to several classification schemes; identified unknown plant species using dichotomous plant keys; conducted literature searches on sensitive plant, wildlife, and vegetation communities; entered vegetation/wildlife data into databases.

6/93-11/96 Research Assistant II, San Diego State University Foundation; Contract biologist for CALTRANS District 11, San Diego, CA

Conducted biological field surveys for plant, wildlife, and vegetation inventories within proposed transportation project corridors, including focused surveys for sensitive plant and animal taxa. Supervised and coordinated other field personnel, evaluated proposed projects for impacts to biological resources; used microscope and dichotomous plant keys to identify unknown plant species; mapped and evaluated plant communities for classification using several vegetation classification schemes. Collected, prepared and cataloged plant voucher specimens, verified taxonomic status of plant specimens, and maintained the onsite herbarium. Mapped sensitive biological resources, prepared biological technical reports; monitored sensitive plants reintroduction projects including *Dudleya viscida, Dudleya variegata,* and *Muilla clevelandii;* monitored riparian mitigation projects. Performed literature and database searches for sensitive plants, wildlife and habitats.

5/93-10/95 Botanist (Seasonal)- Regional Environmental Consultants (RECON), San Diego.

Conducted focused surveys for vernal pools and their associated rare plant species. Mapped vernal pools and associated watersheds for incorporation into GIS database; collected baseline species inventory and ecological data for vernal pool restoration monitoring projects; performed literature and database searches;

and mapped exotic pest plant populations for the Fallbrook Naval Weapons Center Noxious Weed Management Program.

8/92-6/93 Graduate Teaching Assistant, San Diego State University, Department of Biology.

Taught bi-weekly laboratory classes in Human Anatomy, supervised two undergraduate teaching assistants, developed study aids, wrote and graded practical exams.

4/92-10/92 Botanist-Research Assistant II, San Diego State University Foundation (for Dr. Paul Zedler).

Mapped sensitive plant species, monitored rare plant growth and distribution; collected, prepared and cataloged plant voucher specimens, verified taxonomic status of plant specimens, wrote species accounts and created botanical illustrations for final report.

6/91-6/92 Botanical Research Assistant II, San Diego State University Foundation (for Dr. Michael Simpson).

Prepared plant materials using histological techniques including plant dissection, paraffin embedding, and sectioning of plant floral material for preparation and mounting on microscope slides. Other duties included botanical illustration, data entry on PC and MacIntosh computers, computerized video image analysis, photographic darkroom work, including developing and printing of black and white film.

PERM

ITS & SURVEY EXPERIENCE

California Department of Fish and Game, Rare, Threatened, and Endangered Plant Collection Permit.

Extensive field work as a U.S. Fish and Wildlife Service employee participating in field surveys for rare, threatened and endangered species including plants, invertebrates (e.g., fairy shrimp species and Delhi Sands flower-loving fly), birds (e.g., light-footed clapper rail, coastal California gnatcatcher, and least Bell's vireo), and mammals (e.g., pacific pocket mouse).

RICK RIEFNER
Biologist/Botanist
Wetlands Specialist And Habitat Restoration Ecologist

SUMMARY OF QUALIFICATIONS:

Mr. Riefner is a field and research biologist, botanist, and wetlands specialist with additional advanced training in habitat restoration and the geomorphology of vernal pools. In the course of his professional experience, Mr. Riefner has published numerous peer-reviewed articles for scientific journals and professional conferences. He has most recently been studying the ecology of Mediterranean-type climates, describing altered fire regime impacts to late-succession species, soil-landform indicators of ephemeral wetlands, habitat ecologies isolating vegetation in California's white oak savannas, nitrate immobilization to control exotic plants, and the role of biological soil crusts in maximizing biodiversity of endangered/threatened species habitats, such as coastal bluff outcrops for Verity's Dudleya, and open-habitat soils for the Quino Checkerspot Butterfly. As a botanist, Mr. Riefner has diverse field experience in both the cryptogamic and phanerogamic vegetation communities of cismontane southern California. He is an expert on the lichens of California, and has discovered and characterized species new to science, reported taxa new to North America, and discovered a new population of an extremely rare species, *Texosporium santi-jacobi*. With the vascular plants, he has discovered a native annual presumed extinct, *Chorizanthe parryi* var. *fernandina*, an African grass new to North America, *Dinebra retroflexa*, and a disjunct population of an extremely rare shrub, *Baccharis malibuensis*. As a restoration ecologist, he was the first to utilize land imprinting and mycorrhizal inoculum in southern California for large-scale restoration of coastal sage scrub, and also was the first to incorporate biological pollution control techniques using submerged aquatic plants, without chemicals, in order to establish and maintain aquatic functions in constructed lakes for wetland mitigation programs in golf courses. He has also designed and implemented a successful large-scale eradication of giant reed (*Arundo donax)* using an hydroax to restore native riparian and alluvial scrub vegetation. Mr. Riefner has particular expertise in the geomorphology/ecology of southern California vernal pools and playas, and has described fluctuations in vegetation, new interpretation of mima mound landforms, and nutrient cycling in these ecosystems that have not been previously studied. He has also served as project manager for numerous wetland delineations, permitting for Section 404 of the Clean Water Act and Section 1600 of the California Fish and Game Code, biological assessment of endangered species, and the design and implementation of mitigation and habitat monitoring programs for clients throughout southern California.

SELECTED RECENT PROFESSIONAL EXPERIENCE:

The 3M Corona Plant Project: Task manager for wetland delineation, vegetation mapping, and assessment of impacts to coastal sage scrub and Stephens' kangaroo rat (*Dipodomys stephensii*); prepared riparian mitigation design and implementation, application for a Department of the Army 404 individual permit, 401 and 1603 regulatory permitting, Section 7 nexus for the threatened California gnatcatcher (*Polioptila californica californica*), and environmental

alternatives analysis for a quarry development project at the 1,321-acre 3M Corona Plant in Riverside County.

Owens Lake Project: Conducted an inventory of algae, cyanobacteria, and biological crusts at Owens Lake to assess potential use of soil-binding organisms to reduce erosion, control particulate emissions, and restore element cycling functions to the dry lake for the Great Basin Unified Air Pollution Control District.

North Peak Project: Task manager for wetland delineation, application for a Department of the Army individual permit and 401 water quality certification pursuant to Section 404 of the Clean Water Act, and State of California 1603 streambed alteration agreement; helped design a chemical-free lake management program utilizing submerged aquatic plants to control pollutants, and designed a riparian forest mitigation plan for a 1,800-acre golf course community / 800-acre conservation bank project near Lake Elsinore, Riverside County.

Liberty Project: Task manager for preparing 404 permits, 401 certification and 1603 Streambed Alteration Agreement, and environmental alternatives analysis for a master-planned community in Lake Elsinore, western Riverside County. Prepared a 120-acre wetlands habitat enhancement project consisting of an operations and management plan, a multi-habitat planting plan, and a monitoring plan incorporating technical aspects of HGM and an ecosystem functional analysis for the back basin of Lake Elsinore. Performed and defended a wetland delineation of potential wetland/jurisdictional habitats associated with the back basin of Lake Elsinore. Delineation defended non-hydric lakebed soils and potentially jurisdictional features including: micro-depressions, desiccation cracks, algal crusts, playa-like habitat, and historic watershed analysis.

California Department of Parks and Recreation - Orange Coast District: Assisted Dr. Roy Shlemon (R.J. Shlemon Associates) and Gerald G. Kuhn (International Foundation for Applied Research in the Natural Sciences) with geotechnical field investigations of a mima mound field at San Clemente State Park, Orange County, to study the formation of mounds and identify features effecting the formation of vernal pools.

- Prepared a bio-technical report and CEQA analysis for a coastal bluff revegetation project / rare plant management program for Blochman's dudleya (*Dudleya blochmaniae*) at San Clemente State Beach.

- Conducted protocol presence/absence and nest monitoring surveys for the coastal California gnatcatcher on the 2,676-acre San Onofre State Park lands in Orange and San Diego counties, and Crystal Cove State Park and San Clemente State Beach in Orange County.

Land Imprinting to Restore Coastal Sage Scrub: Designed, implemented, and monitored approximately 50 acres of coastal sage scrub restoration in Orange, Riverside, and San Diego counties using a land imprinter and mycorrhizal inoculum.

Arundo Removal: Designed and implemented a successful large-scale eradication of giant reed (*Arundo donax)* using an hydroax, nitrate immobilization techniques, a multi-habitat planting

palette, and creation of micro-topographic diversity in order to restore riparian and alluvial scrub habitats along Temescal Wash at the 3M Plant in Corona, Riverside County.

NCCP North Ranch Policy Plan Area in Orange County: Helped to design and implement a drift-fence/pitfall trapping study to document the herpteofauna, and conducted focused surveys and a habitat assessment for the federally listed Arroyo Toad and Red-Legged Frog at this 9,500-acre property.

Botanical Surveys: Performed numerous focused surveys for sensitive and endangered plant species in southern and central California such as (but not limited to) Lyon's pentachaeta (*Pentachaeta lyonii*), Braunton's milk-vetch (*Astragalus brauntonii*), ditch navarretia (*Navarretia fossalis*), Laguna Beach dudleya (*Dudleya stolonifera*), big-leaved crown beard (*Verbesina dissita*), Orcutt's grass (*Orcuttia californica*), salt marsh bird's-beak (*Cordylanthus maritimus & C. palustris*), slender-horned spine-flower (*Dodecahema leptoceras*), Parish's meadowfoam (*Limnanthes gracilis parishii*), Conejo buckwheat (*Eriogonum crocatum*); and the many-stemmed dudleya (*Dudleya multicaulis*), beargrass (*Nolina cismontana*), and Coulter's saltbush (*Atriplex coulteri*) for the NCCP's Southern Subregion Reserve, the 9,500-acre North Ranch Policy Plan Area, and the 13,000-acre East Orange Project.

California Environmental Quality Act Project: Prepared a CEQA analysis of indirect impacts, and designed mitigation measures that would reduce potentially significant secondary impacts to the federally-listed threatened Conejo Dudleya (*Dudleya parva*) to a level of insignificance at a single-family dwelling site in the City of Thousand Oaks, Ventura County.

Mr. Riefner has also conducted numerous wetland delineations, provided regulatory services, and/or designed and implemented bio-tech surveys, and mitigation and habitat monitoring programs for clients throughout southern California, including: the Carlsberg Project, Oak Park, Ahmanson Ranch, Big Sky, and Stevenson Ranch in Ventura County; Paloma del Sol, Audi Murphy Ranch, Greer Ranch in Riverside County; and Sunny Creek and Sunny Terraces, Del Mar Highlands Estates, the Future Urban Planning Areas in San Diego County, the Irvine Ranch Water District in Orange County, and the Inland Feeder Project in Riverside County and San Bernardino County for the Metropolitan Water District of Southern California.

PROFESSIONAL EMPLOYMENT HISTORY:

10/2001 - Present	Botanist, Wetland Specialist, and Habitat Restoration Ecologist; Glenn Lukos Associates, 29 Orchard, Lake Forest, CA 92630-8300.
1/2001 - 10/200	Consulting Biologist; Rick Riefner Associates, Tustin, CA 92780.
9/2000 - 1/2001	Senior Biologist; Psomas Inc., 3187 Red Hill Ave, Coasta Mesa, CA 92626.
11/1999 - 8/2000	Senior Botanist & Wetlands Specialist; Harmsworth Associates, Dove Canyon, CA.
8/1995 - 10/1999	Habitat Restoration Specialist; Glenn Lukos Associates, 23441 South Pointe Dr., Laguna Hills, CA 92653.

4/1994 - 7/1999	Environmental Services Intern; California Park Service, Orange coast District, San Clemente, CA 92672.
5/1992 - 8/1992	Museum Scientist; Museum of Systematic Biology, University of California, Irvine, CA 92679.
1982 - 1990	Night Manager-Bartender; Crazy Horse Steakhouse, Santa Ana, CA.
1977 - 1981	Lab Technician: Analytical Chemistry & Microbiology; Joseph E. Seagram & Sons, Relay, Maryland.
1976 - 1977	Biologist; Maryland Department of Natural Resources, Land Planning Services, Annapolis, Maryland.

EDUCATION:

1981	Post graduate studies - University of Michigan Biological Station
1980	Post graduate studies - University of Maryland, College Park
1975	B.S. - Biology - Towson State University, Maryland

AWARDS:

1999. *Outstanding Contribution to Field Botany in Southern California: Rediscovery of Chorizanthe parryi var. fernandina.* Presented by Southern California Botanists, Biodiversity Conference, California State University, Fullerton, 23 October 1999.

SPECIAL PERMITS:

U.S. Fish and Wildlife Service Endangered Species Permit 10(a)1(A) PRT-827494, renewal: TE-827494-1; presence/absence surveys and nest monitoring of Coastal California Gnatcatcher (*Polioptila californica californica*); expires 10-19-2003.

CA Department of Fish and Game, State Resident Scientific Collecting Permit; marine algae - tidal invertebrates, and special concern reptiles and amphibians; PRT No. 801029-05; renewal 801046-01, expires 4-11-03.

PROFESSIONAL AFFILIATIONS:

American Geophysical Union
CalEPPC
California Botanical Society
California Native Plant Society
California Lichen Society
Natural Areas Association
Rancho Santa Ana Botanic Garden - *Research Associate*

Sigma Xi, The Scientific Research Society – *University of California, Riverside*
Society for Ecological Restoration
Southern California Botanists

SYMPOSIA / CONFERENCE PARTICIPANT:

2000. *Trends and Lessons in Ecological Restoration.* SERCAL Conference 2000. "Biological Crusts and Rock-Loving Lichens Enhance Seedling Establishment of Rare *Dudleya* Species [Crassulaceae] in Southern California." Poster presented October 26-29, Santa Barbara. R.E. Riefner, Jr. and Carl Wishner.

2000. *Exotic Plants in the Landscape: Processes and Patterns.* CalEPPC Symposium 2000. "Biological Exclusion of Exotic Weeds from Open-Soil Habitats and the Conservation of Endangered Species." Poster presented October 6-8, Concord. R.E. Riefner, Jr. and T. St. John.
1997. *Restoration As Process.* SERCAL Sixth Conference, San Luis Obispo. "Native Grasses, Mycorrhizae, and Soil-Surface Processes Restore Ecosystem Function." T. St. John, R.E. Riefner, Jr., and D.R. Pryor.

1997. *Annual Association Of Engineering Geologists,* Portland. "Origin of Mima-Mound Fields." R. Shlemon, G. Kuhn, B. Boka, and R.E. Riefner, Jr.

1997. *Second Interface Between Ecology And Land Development In California,* Occidental College, Los Angeles. "Prescribed Burning Impacts to Late Succession Species." P.A. Bowler and R.E. Riefner, Jr.

1984. *Threatened And Endangered Plants And Animals Of Maryland.* Maryland Natural Heritage Program - The Nature Conservancy. "Ecology and Floristics of Limestone Habitats in Maryland." Baltimore, Maryland. R.E. Riefner, Jr. and S.R. Hill.

SELECTED ADDITIONAL TRAINING:

2002	*Invasive Plant School*: University of California, USDA Cooperative Extension, San Diego. Certificate of Completion.
2002	*Laboratory Methods for Identification of Mycorrhizal Infection*: St. John Consulting, Riverside.
2000	*CEQA and Strategic Planning*: UCLA Extension, Universal City.
2000	*Field Biology in the New Century: Changing roles for the public and private sector:* The Wildlife Society, Riverside.

1999 *Neotectonics in North Coastal San Diego County, California*: American Geological Society, Carlsbad; and South Coast Geological Society, Santa Ana.

1998 *Declining Amphibians in California*: San Diego Natural History Museum.

1997 *The Elfin Forest: Southern California Chaparral*: Southern California Botanists, California State University, Fullerton.

1997 *California Coastal Geology*: International Foundation for Applied Research in the Natural Sciences, Carlsbad.

1996 *CalEPPC Symposium '96*: California Exotic Pest Plant Council, San Diego.

1996 *Ecology, Conservation, and Management of Vernal Pool Ecosystems*: CNPS, Society for Ecological Restoration, and The Wildlife Society, Sacramento.

1996 *Wetland Delineation*: Army Corps of Engineers, 1987 Manual. The Wetland Training Institute, Sacramento. Certificate of Completion.

1995 *Native Grassland Vegetation*: California Native Grass Association. Santa Ana Botanic Garden, Claremont. Certificate of Completion.

1994 *Brushfires in California Wildlands: Ecology and Resource Management*. Southern California Academy of Sciences, University of California, Irvine.

1994 *Habitat Restoration Case Studies*: University of California, Riverside.

PUBLICATIONS:

Riefner, R.E., Jr. and D.R. Windler. 1979. *Polygonum perfoliatum* L. established in Maryland. *Castanea* 44:19-23.

Riefner, R.E., Jr. 1979a. *Leucothoe axillaris* var. *editorum* (Fern. & Schub.) Ahles new to Maryland. *Castanea* 44: 59.

Riefner, R.E., Jr. 1979b. Additions to the vascular flora of Maryland. *Castanea* 44: 186-187.

Riefner, R.E., Jr. and J. Tremper. 1980. *Magnolia macrophylla* Michaux naturalized in Maryland. *Phytologia* 46: 283-284.

Riefner, R.E., Jr. and D.R. Windler. 1980. Devil's tail invades Maryland. *Maryland Conservationist* 56: 8-11.

Riefner, R.E., Jr. 1981a. Notes on some proposed rare and endangered vascular plant species in Maryland. *Phytologia* 47: 397-403.

Riefner, R.E., Jr. 1981b. Studies on the Maryland flora VII: Addition of *Cyperus houghtonii* Torrey and *Juncus trifidus* var. *monanthos* (Jacq.) Bluff & Fing. to the state flora. *Phytologia* 48: 146-150.

Riefner, R.E., Jr. 1981c. Studies on the Maryland flora VIII: Range extensions of *Polygonum perfoliatum* L., with notes on introduction and dispersal in North America. *Phytologia* 50: 152-159.

Riefner, R.E., Jr. 1982. Studies on the Maryland flora IX: *Cakile maritima* Scop. naturalized in the Chesapeake Bay region. *Phytologia* 50: 207-208.

Hill, S.R. and R.E. Riefner, Jr. 1982. New records and distributional notes on Maryland pteridophytes. *American Fern Journal* 72: 45-58.

Riefner, R.E., Jr. and S.R. Hill. 1983. Notes on infrequent and threatened plants of Maryland including new state records. *Castanea* 48: 117-137.

Voss, E.G. and R.E. Riefner, Jr. 1983. A pyralid moth (Lepidoptera) as pollinator of blunt-leaf orchid. *Great Lakes Entomologist* 16: 57-60.

Riefner, R.E., Jr. and S.R. Hill. 1984. Ecology and floristics of limestone areas: An important habitat for Maryland plants. *In*: Norden A.D., D. Forester and G.H. Fenwick (eds.). Threatened and endangered plants and animals of Maryland. *Maryland Natural Heritage Program Special Pub.* 84-1: 161-193. Maryland Dept. of Natural Resources.

Riefner, R.E., Jr. 1989. *Punctelia punctilla* (Hale) Krog new to North America. *Phytologia* 67: 254-257.

Riefner, R.E., Jr. 1990. *Pertusaria pseudocorallina* and *Ramalina fastigiata* new to North America. *Mycotaxon* 39: 31-41.

Bowler, P.A. and R.E. Riefner, Jr. 1990. A preliminary lichen checklist of the University of California, Irvine campus and the San Joaquin Wetlands. *Crossosoma* 16(6): 1-10.

Riefner, R.E., Jr. and P.A. Bowler. 1994. *Ramalina baltica* and *Ramalina canariensis* in North America. *Mycotaxon* 51: 495-501.

Riefner, R.E., Jr. and P.A. Bowler. 1994. *Ramalina puberulenta*: A new lichen from California. *Mycotaxon* 52: 247-257.

Bowler, P.A., R.E. Riefner, Jr., J. Marsh, T.H. Nash III, and P. Rundel. 1994. New species of *Niebla* (Ramalinaceae) from North America. *Phytologia* 77: 23-37.

Riefner, R.E., Jr. and P.A. Bowler. 1995. Cushion-like fruticose lichens as *Dudleya* seed traps and nurseries in coastal communities. *Madroño* 42: 81-82.

Riefner, R.E., Jr., P.A. Bowler, J. Marsh, and T.H. Nash III. 1995. *Niebla tuberculata* (Ramalinaceae): A new lichen from California. *Mycotaxon* 54: 397-401.

Bowler, P.A. and R.E. Riefner, Jr. 1995. Notes on the *Ramalinaceae* and current related research in California, U.S.A. *Bulletin of the California Lichen Society* 2: 1-5.

Riefner, R.E., Jr., P.A. Bowler, and B. Ryan. 1995. New and interesting records of lichens from California. *Bulletin of the California Lichen Society* 2: 1-11.

Bowler, P.A., W.A. Weber, and R.E. Riefner, Jr. 1996. A lichen checklist of San Clemente Island, California. *Bulletin of the California Lichen Society* 3:1-8.

Riefner, R.E., Jr. and D. Pryor. 1996. New locations and interpretation of vernal pools in southern California. *Phytologia* 80: 296-327.

Shlemon, R.J., G.G. Kuhn, B. Boka, and R.E. Riefner, Jr. 1997. Origin of a mima-mound field, San Clemente State Park, Orange County, California: A test of the seismic hypothesis. *In*: Program with Abstracts - *40th Annual Association of Engineering Geologists* - pages 148-149, Portland.

Bowler, P.A. and R.E. Riefner, Jr. 1997. Prescribed burning impacts to late successional species. J. Keeley (ed.) Proceedings for the *Second Interface Between Ecology and Land Development in California*. Poster presented: Occidental College, Los Angeles.

St. John, T., R.E. Riefner, Jr., and D.R. Pryor. 1997. Native grasses, mycorrhizae, and soil-surface processes restore ecosystem function. *In*: Program with Abstracts - *Restoration as Process through Philosophy, Ecology and Community* - page 70, SERCAL Sixth Annual Conference, San Luis Obispo.

Riefner, R.E., Jr., D.R. Pryor, and T. St. John. 1998. Effects of Mycorrhizae: Restoration at San Onofre State Beach, California. *Land and Water* 42: 15-18.

Riefner, R.E., Jr., J. Tiszler, and S. Boyd. 1999. Noteworthy Collection: *Navarretia mellita* in Ventura County, CA. *Crossosoma* 25: 83-84.

Riefner, R.E., Jr. 1999. [Cover Photograph]. *CalEPPC News*. Spring 7: 1

Riefner, R.E., Jr. and C. Wishner. 2000. Biological crusts and rock-loving lichens enhance seedling establishment of rare *Dudleya* species (Crassulaceae) in southern California. J. St. John and S. Clark (eds.). Trends & Lessons in Ecological Restoration. *In:* Program with Abstracts, pg. 39, *The Seventh Annual Conference of SERCAL*. Poster Presented: October 26-29, 2000, University of California at Santa Barbara.

Riefner, R.E., Jr. 2000. Noteworthy Collection: *Xanthoparmelia angustiphylla* in the Santa Ana Mountains, Orange County, CA. *Crossosoma* 26: 15-16.

Bowler, P.A. and R.E. Riefner, Jr. 2000. Prescribed burning impacts to late successional species. Pp 71-73. J. Keeley, M. Baer-Keeley, and C.J. Fotheringham (eds.) *Second Interface Between Ecology and Land Development in California*. U.S. Geological Survey Open-File Report 00-62.

Riefner, R.E., Jr. 2002. [Cover Photograph]. Nature's perfect erosion control plants. *CyanoNet,* BioNet LLC, Marina, CA.

Riefner, R.E., Jr., S. Boyd, and R.J. Shlemon. 2002. *Eleocharis obtusa* var. *engelmannii* new to southern California. *Crossosoma* 27: 52-54.

Riefner, R.E., Jr. and T. St. John. In press. Biological exclusion of exotic weeds from open-soils habitats and the conservation of endangered species. J. DiTomaso (ed.). Exotic Plants in the Landscape: Patterns and Process. *In*: Proceedings for the *California Exotic Pest Plant Council Symposium 2000.* Poster presented October 6-8, 2000, Concord.

Riefner, R.E., Jr., and S. Boyd. In Press. *Malacothrix saxatilis* var. *saxatilis* discovered in Orange County, southern California. *Crossosoma.*

Riefner, R.E., Jr., C. Wishner, P.A. Bowler, and T. Mulroy. In press. Rock-inhabiting lichens and biological crusts enhance recruitment success of rare *Dudleya* species [Crassulaceae] in southern California. *Crossosoma.*

Riefner, R.E., Jr., G. Pratt, R. J. Shlemon. In review. *Texosporium santi-jacobi*, a new record of a rare soil lichen and the importance of preserving open-habitat soils in southern California. *Madroño.*

Columbus, J.T., R.E. Riefner, Jr., and S. Boyd. In Preparation. *Dinebra retroflexa*, an African grass new to North America. *Madroño.*

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Education

B.Sc. in Biology, specializing in Botany;
University of California, Riverside. June 1975.

Employment

1. U.S. Department of the Interior, Bureau of Land Management (Riverside and Bakersfield Districts and California Desert Plan Staff). Aug. 1975 to Apr. 1978 During this period I held positions as a Wildlife Biologist, Natural Resource Technician, and Range Conservationist and worked on the following projects:

   California Desert Plan
   Geothermal Energy Leasing Environmental Impact Statements
   - East Mesa
   - N. Salton Sea
   - Red Mountain
   - Yuha Basin

   McCain Valley Habitat Management Plan
   Owens Valley Range Program
   Sun Desert Transmission Line E.I.S.

In the course of these projects I conducted extensive field surveys of vegetation and wildlife in the desert of southern California and in the Owens Valley.

2. University of California, Riverside. Dept. of Biology. Staff Research Associate and resident biologist at the James Reserve in the San Jacinto Mountains of Riverside County California. April 1978 to Sept. 1979. While at the James Reserve I surveyed the flora and fauna of the San Jacinto Mtns. and began the compilation of a list of the plants of the reserve, which was later completed in cooperation with Ken Berg, my successor.

3. University of California, Riverside. Dept. of Botany & Plant Sciences. Since September 1979 I have been Museum Scientist and curator of the Herbarium. This has involved extensive work with the flora of the southwestern U.S. and adjacent areas. I have identified literally tens of thousands of plant specimens and have enlarged the UCR

collection to ten times its former size. I have personally collected over 24,000 plant specimens in western North America. As a result of my work at the herbarium, I have come to be extremely familiar with the flora of southern California and can identify the overwhelming majority of plant species from this area on sight.

Additional Experience

I have contributed botanical/biological inventories for the following projects in California. This list is not comprehensive, but is representative.

Imperial Co.
Botanical Survey for U.S. Navy, Chocolate Mtns. Aerial Gunnery Range. 1988-1991.

Kern Co.
Biological Survey for a parcel near Rosamond, prepared for Land Concepts, Inc. 1988.

Botanical Survey for Silver Peak Mine Expansion, prepared for Weber & Weber Mining Consultants. 1989.

Botanical Survey of the Wind Wolves Preserve (San Emigdio Ranch), prepared for the Wildlands Conservancy. In progress.

Los Angeles Co.
Botanical Survey for Portuguese Bend Land Use Plan, prepared for England and Nelson Environmental Consultants. 1976.

Botanical survey of El Segundo Dunes, for L.A. International Airport, through Agresearch, Inc. 1987-1988.

Botanical surveys for several projects in the Lancaster vegetation management zone, prepared for the Dept. of Community Development, City of Lancaster. 1988-1989.

Orange Co.
Botanical survey for Land Use Plan for the Silverado-Santiago area of the Santa Ana Mtns., prepared for England & Nelson Environmental Consultants. 1976.

Riverside Co.
Botanical survey for the Riverside Co. Southwest Territory General Plan, for Riverside Co. Planning Dept. 1977.

Botanical survey for the Army Corps of Engineers Whitewater Flood Control Project. 1980.

Botanical Survey for Kacor Realty Wolf Valley Development, prepared through L. LaPré, consultant. 1981.

Botanical survey of the U. C. Motte Reserve near Perris. 1982.

Botanical survey of 500 ac. property near Murrieta, prepared for P. Principe, consultant. 1988.

Botanical survey of the Nature Conservancy Oasis de Los Osos Preserve. 1985-1988.

Biological Survey for Proposed Sanderson Ave. Bridge and Realignment, near San Jacinto, prepared for Myra L. Frank and Associates. 1990.

Rare plant Survey for the Coachella Valley Multi-Species Habitat Conservation Plan, prepared through Thomas Olson & Associates. 1995.

Botanical Survey of a pipeline route along the San Jacinto River, prepared through KDJ and Associates. 1996.

Botanical Survey of the Shipley Multi-species Reserve at Lake Skinner. In progress.

San Bernardino Co.
Biological survey for Big River Development, Colorado River near Parker. 1980.

Botanical Survey for Cactus Hill Mine, Ivanpah Mtns, prepared for J. McMains, consultant. 1985.

Biological survey of 640 ac. parcel near Pioneertown prepared for The Nature Conservancy. 1986.

Botanical Survey for Don Brown Racing Facility, Cajon Pass area. 1986.

Botanical Survey for Hart Mine expansion, Mojave Desert, prepared for J. McMains, consultant. 1986.

Scoping Report for Santa Ana River Resource Management Plan, prepared for the County of San Bernardino Dept. of Environmental Public Works. 1987.

Biological survey for Devil Canyon Powerplant expansion, prepared for the California Dept. of Water Resources. 1987.

Botanical survey for Glen Helen Sheriff's Academy expansion, prepared for the San Bernardino County Sheriff's Dept. 1987.

Biological Survey for the Daley Transit Mix Property near Ft. Irwin, Mojave Desert. 1988

Botanical Survey for proposed Davis Ranch Mine, Cajon Pass, prepared for Weber & Weber Mining Consultants. 1989.

Botanical Survey for Silver Peak Mine Expansion, prepared for Weber & Weber Mining Consultants. 1990.

Botanical Survey for Cajon East (Cleghorn) Mine Expansion, prepared for Weber & Weber Mining Consultants. 1990.

Botanical Survey for National Can Parcel, Verdemont, prepared for McClelland Associates. 1990.

Biological Survey of Birmingham Ranch, prepared for the City of Yucaipa. 1992.

Biological Survey of Porter Ranch, prepared for the City of Yucaipa. 1993.

Biological Survey of the Yount/Mitchell property near Yucaipa, prepared for Robin Isakson & Associates. 1993.

Biological Survey of 100 acre property in Yucaipa, prepared for George Polycrates and Associates. 1996.

Botanical Survey of the central Avawatz Mtns., Mojave Desert, prepared for Gordon F. Pratt, consulting entomologist. 1997.

Outside of California I have done extensive field work and made numerous plant collections throughout the southwestern U.S., but particularly in Nevada and Arizona. I have also worked extensively in Mexico and am presently involved in three floristic projects in that country. I spent 12 weeks doing botanical survey work in Costa Rica during 1995 and 1996.

In addition to the above, I regularly make plant identifications (including fossils) for professional biological consultants, for scientific researchers, and for the general public. I commonly make plant identifications for biological consultants, and over the years have literally made thousands of such determinations. I have identified plants on one or more occasions for the following Riverside County Qualified Environmental Consulting Firms and have done so regularly for several of them (*):

AMEC Earth & Envir., Inc.*
Beaman Biological Consulting
Biological Resource Specialists
Campbell Biological Consulting
CH2M Hill*
David E. Bramlet
Glen Lukos Assoc.
Harmsworth Assoc.
James Cornett Ecol. Cons
Joan R. Callahan
Kelly Volansky*

Ken Osborne
LSA Assoc.*
Natural Resource Assessment, Inc.*
P. & D. Environmental*
PCR Inc.
Principe and Assoc.
San Bernardino Co., Museum
Statistical Research Inc.
Ted Rado
TeraCor Resource Mgmt.*
TetraTech
Thomas Olsen & Assoc. *
Tierra Madre Connsultants*
Tom Dodson & Assoc.*
VHBC Consulting
W.D. Wagner
White & Leatherman*

I am generally recognized as one of the foremost authorities on the flora of Southern California and am regularly contacted by the US Fish & Wildlife Service and California Dept. of Fish and Game for information on the status and distribution of threatened and endangered plant species. In particular, I was queried regularly about species covered by the Riverside County MSHCP. I am regularly called upon to identify plant fragments which represent evidence in criminal cases.

Publications

Boyd, S. and A.C. Sanders. 1999. "Noteworthy Collections, California – Dicentra chrysantha, Euphorbia anramsiana, Holocarpha heermannii, Madroño 46 (2): 112.

Costea, M., A.C. Sanders & J. G. Waines. 2001. Preliminary results toward a revision of the Amaranthus hybridus species complex (Amaranthaceae) Sida 19 (4): 931-974

Costea, M., A.C. Sanders & J. G. Waines. 2001 Notes on some little known Amaranthus taxa (Amaranthaceae) in the United States Sida 19 (4): 975-992.

Costea, M., A.C. Sanders & J. G. Waines. 2002? Amaranthus Aliso In press

Cudney, D., C. Bell & A. C. Sanders. 1997. Weedy spurges in California, U. C. Extension Circular. Revised 2002.

Friedman, S. L., T. R. Van Devender, V. W. Steinmann, A. C. Sanders, P. D. Jenkins, S. A. Meyer, A. L. Reina Guerrero, D. A. Yetman, R. S. Felger & R. A. Lopez Estudillo. 1996. "Noteworthy Collections, Sonora, Mexico -- Brickellia brandegei, Cordia globosa, Bromelia alsodes, Selenicereus vagans, Capparis flexuosa, Ipomoea imperati, Operculina

pennatifida, Doyera emetocathartica, Momordica charantia, Bergia texana, Caesalpinia sclerocarpa, Mimosa asperata, Pholisma culiacanum, Nesaea longipes, Malpighia glabra, Bastardia viscosa, Okenia hypogea, Oenothera drummondii var. thalassaphila, Ophioglossum nudicaule, Luziola gracillima, Panicum antidotale, Tridens eragrostoides, Amyris balsamifera, Capraria biflora, Solanum azureum, Citharexylum scabrum, Lippia graveolens", Madroño 43(4):532-538.

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Jones, C. E., A. C. Sanders, et al. 1979. "Noteworthy Collections, California -- Physalis lobata, Madroño 29 (2): 101.

Krantz, T. P., R. F. Thorne & A. C. Sanders. 2003?, A Flora of the San Bernardino Mountains, California, nearing completion.

Minnich, R. A. and A. C. Sanders, 2000, Sahara Mustard (Brassica tournefortii), in California's Wildland Weeds: Identification and Control, C. Bossard, J. Randall, & M. Hoshovsky, eds, University of California Press

Sanders, A. C., 1996. "Noteworthy Collections, California -- Acrachne racemosa, Aegilops cylindrica, Atriplex mulleri, Baileya multiradiata, Bromus secalinus, Cenchrus ciliaris, Centaurea diffusa, Centaurea maculosa, Ceratonia siliqua, Chloris truncata, Cynanchum louiseae, Ephedra funerea, Eragrostis curvula var. conferta, Fatoua villosa, Linanthus orcuttii, Matricaria globifera, Melica californica, Melissa officinalis, Panicum antidotale, Panicum maximum, Pistacia atlantica, Schinus polygamus, Schoenus nigricans, Scribneria bolanderi, Senna obtusifolia, Solanum mauritianum, Triteleia hyacinthina", Madroño 43(4):524-532.

Sanders, A. C., 1997. "Noteworthy Collections, California -- Gaura parviflora, Crepis tectorum", Madroño 44 (3) 306-307.

Sanders, A.C. 1998. Polygonaceae in Martin, P., et al (revised & ed.). 1998. Gentry's Río Mayo Plants: the tropical deciduous forest & environs of northwest Mexico, University of Arizona Press.

Sanders, A.C. 1999. Invasive Exotics in California: a Perspective from Inland Southern California. In: M. Kelly, E. Wagner, and P. Warner (eds.). Proceedings of the California Exotic Pest Plant Council Symposium. Vol 4: 1998. Pp. 7-10.

Sanders, A. C. 2003?, "A Flora of the Box Springs Mountains and Vicinity, Riverside and San Bernardino Counties, California", Crossosoma, in preparation.

Sanders, A. C., 2003?. "Noteworthy Collections, California --Allium vineale, Celtis sinensis, Cestrum nocturnum, Colutea arborescens, Crepis nana, Cynosurus echinatus, Desmodium tortuosum, Eruca vesicaria var. sativa, Gilia maculata, Gnaphalium purpureum, Gypsophila elegans, Horkelia cuneata ssp. puberula, Leonotus nepetifolia, Nerium oleander, Phaseolus filiformis, Pinus attenuata, Pinus jeffreyi, Rhamnus alaternus, Salvia reflexa, Ziziphus obtusifolia", Madroño, submitted.

Sanders, A. C., D. L. Banks & S. Boyd , 1997 "Rediscovery of Hemizonia mohavensis Keck (Asteraceae) and addition of two new localities", Madroño 44 (2): 203-210.

Sanders, A. C. and S. Boyd, 1996. "Noteworthy Collections, California, -- Brassica fruticulosa", Madroño 43(4):523-524.

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Sanders, A. C. and D. Cudney, 1991. "Key to the Families of Weeds of the West", in Weeds of the West, T. D. Whitson, ed., Western Society of Weed Science.

Sanders, A. C. and D. Koutnik, 1997. "Noteworthy Collections, California, -- Euphorbia dendroides, E. esula, E. hirta, E. nutans, E. oblongata, E. revoluta, E. terracina", Madroño 44(2): 203-210.

Skinner, M. W., D. P. Tibor, R. L. Bittman, B. Ertter, T. S. Ross, S. Boyd, A. C. Sanders, J. R. Shevock & D. W. Taylor, 1995. "Research Needs for Conserving California's Rare Plants", Madroño 42(2): 211-241.

Van Devender, T. R., A. C. Sanders, R. K. Wilson, & S. A. Meyer. "Vegetation, Flora, and Seasons of the Rio Cuchujaqui, A Tropical Deciduous Forest near Alamos, Sonora, Mexico", in The Tropical Deciduous Forest of the Alamos, Sonora, Region: Ecology and Conservation of a Threatened Ecosystem, ed. by R. H. Robichaux.

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Vasek, F. C. & A. C. Sanders, 1983. "Distribution of Polygala acanthoclada", Madroño 30 (3): 193-194.

White, S. and A. C. Sanders, 1997. "Clarification of Three Camissonia Boothii Subspecies' Distributions in California", Madroño 44 (1): 106-112

White, S., A. C. Sanders & M. Wilcox 1996. "Noteworthy Collections, California, -- Androstephium breviflorum, Claytonia lanceolata, Nicotiana acuminata, Ranunculus scleratus, Madroño 43 (2): 334-335.

ANDREW THOMSON
ENVIRONMENTAL SPECIALIST

EDUCATION

- Washington State University
M.S., Environmental Science, 2000

- Utah State University
B.S., Biology, 1997

EXPERIENCE SUMMARY

Mr. Thomson has a Master of Science degree in Environmental Science and a Bachelor's degree in Biology. He has worked on a variety of habitat restoration projects with the U.S. Forest Service and has been involved with threatened and endangered plant species surveys and sensitive habitat protection in the Big Bear area. He is currently working on a variety of habitat restoration projects with various responsibilities at DUDEK.

PROFESSIONAL ASSIGNMENTS

Sensitive Plant Habitat Projects

Mr. Thomson is currently involved with three separate sensitive plant habitat projects. He has been responsible for monitoring the progress of the following projects as well as documenting that progress in annual project reports:

- **4S Ranch Thread-Leaved Brodiaea and San Diego Goldenstars Mitigation/Transplantation Program, Rancho Bernardo, CA.** Mr. Thomson assisted with the plant monitoring and was responsible for preparing the annual progress report for this project.

- **Kumeyaay Campground San Diego Ambrosia Transplantation Project, San Diego County, CA.** Mr. Thomson was responsible for the biological monitoring and the preparation of a status report for this project.

- **State Route 125 Otay Tarplant Salvage and Habitat Replacement Project, San Diego County, CA.** Mr. Thomson is involved with ensuring successful plant salvage and relocation of Otay tarplant for the construction of SR125. He is also assisting with the determination of suitable receptor sites for salvaged Otay tarplant seed and accompanying soil.

Habitat Restoration and Habitat Monitoring Plan Writing

- **Arroyo Trabuco Golf Course Coastal Sage Scrub and Valley Needlegrass Grassland Revegetation Plan, Orange County, CA.** Mr. Thomson was responsible for drafting the habitat restoration plan for the 230-acre Arroyo Trabuco Golf Course project in Orange County. For this project he prepared a revegetation plan that included both coastal sage scrub and Valley needlegrass grassland restoration.

- **Sorrento Creek Flood Control Channel Monitoring Plan, City of San Diego, CA.** Mr. Thomson assisted with the preparation of the Sorrento Creek Flood Control Channel Monitoring Plan for the City of San Diego, California. The Plan included methodology and rationale for monitoring adverse effects resulting from the creation and maintenance of the Sorrento Creek flood control channel.

Vegetation Mapping and Rare Plant Surveys

Mr. Thomson has been involved with both vegetation mapping and rare plant surveying in the following projects:

- **Finger Canyon Vegetation Mapping, San Diego County, CA.** Mr. Thomson was involved with mapping habitat types including coastal sage scrub, southern maritime chaparral, willow woodland, and fresh water marsh within the preserved habitat in Finger Canyon.

- **Irvine Ranch Housing Development Project, Orange County, CA.** Mr. Thomson assisted in the rare plant surveys for the sensitive plant, intermediate mariposa lily.

Vegetation Monitoring and Reporting

Mr. Thomson has been involved in a number of projects requiring vegetation monitoring and reporting. He has been responsible for setting up monitoring transects and gathering qualitative and quantitative biological data for use in reporting in the following projects:

- **North City Raw Sludge and Water Pipelines Revegetation Project, San Diego County, CA.** Responsible for biological monitoring and report preparation.

- **Sorrento Valley Utilities Improvement Revegetation Project, San Diego County, CA.** Assisted with biological monitoring, data management, and report preparation.

- **North Metro Revegetation Project, San Diego County, CA.** Assisted with biological monitoring.

- **Rolling Hills Ranch Wetland Mitigation Project, Chula Vista, CA.** Assisted with biological monitoring and report preparation.

- **Encinitas Ranch Golf Course Revegetation, Permitting & Chaparral Revegetation, Encinitas, CA.** Assisted with biological monitoring.

Construction and plant installation monitoring

Mr. Thomson has been involved with monitoring construction activities in sensitive habitats and installation of plants for the following restoration projects:

- **Brookview Senior Housing Project, Poway, CA.** Assisted with construction monitoring during the plant installation and seed application processes.

- **Ocean Trails Golf Course Revegetation Project, Los Angeles County, CA.** Assisted with plant installation monitoring and quantitative analysis for coastal sage scrub habitat.

- **City of San Diego Metropolitan Wastewater Department (MWWD) as Needed Biologist, City of San Diego, CA.** Assisted with construction monitoring, impact analyses, biological report preparation and mitigation recommendations for MWWD projects involving necessary sewer line maintenance and emergency sewer break repair.

PRIOR WORK EXPERIENCE

Biological Technician

Mr. Thomson provided ecological restoration work for the U.S. Forest Service involving native seed collection and germination, plant propagation and pest management, outplanting to damaged sites; designing experimental plots, maintaining records and monitoring restoration success, adapting methods

as necessary; organizing and supervising volunteer groups that contribute time to wildlife and plant habitat improvement projects; participating as a crew member to complete biological surveys including threatened, endangered, and sensitive plant species; mapping locations using Global Positioning System (GPS) units, entering points and creating maps with Geographic Information System (GIS); and writing ecological restoration program grants.

Field Research Assistant

As a field research assistant in the Biology Department at Utah State University, Mr. Thomson was responsible for surveying plant populations for research site selection; setting up research plots; sampling and mapping a noxious weed species, using GPS technology; processing GPS field data using Pathfinder software; preparing statistical summaries and maps using Excel and ArcView software for review by other team members on the biological control project; and working with team members to monitor and record study results.

Field Technician Assistant

As a field technician assistant with the U.S. Department of Agriculture and Utah State University, Mr. Thomson was responsible for germinating several varieties of grasses and legumes utilizing various scarification techniques; propagating plants in greenhouses; caring for plants including pest control and fertilization; collecting and analyzing field data; operating machinery; maintaining plots through cultivation of grasses and control of weeds; and preparing samples for nutrient analysis.

JULIE M. VANDERWIER
Senior Biologist

EDUCATION

- California Polytechnic State University,
  San Luis Obispo
  M.S. Biological Sciences (Plant Ecology and Taxonomy) 1987

- California Polytechnic State University,
  San Luis Obispo
  B.S. Biological Sciences (Field Biology) 1977

EXPERIENCE SUMMARY

Ms. Vanderwier has 20 years of experience as a field ecologist and regulatory biologist in central and southern California. Although trained as a plant ecologist, she also has considerable field experience with a number of sensitive and listed animal species, particularly those which occur in vernal pools, coastal salt marsh, and sage scrub habitats. Plant communities with which she has specific expertise include coastal sage scrub, maritime chaparral, coastal salt marsh, and vernal pools, as well as the flora of the California Channel Islands and the Baja California peninsula. In 1991, she was the lead botanist on a five-week survey throughout Baja to determine the presence and distribution of the California gnatcatcher and its habitat. In concert with her field experience, Ms. Vanderwier has 16 years of regulatory experience, and has prepared numerous technical documents, including biological constraints reports, environmental and biological assessments, biological opinions, and habitat conservation plans. Work experience with the Department of Defense, California Department of Fish and Game, local jurisdictions, University of California Natural Reserve System, U.S. Fish and Wildlife Service, and the private sector has provided Ms. Vanderwier with an extremely diverse biological background.

At DUDEK, Ms. Vanderwier serves as a senior biologist in the Environmental Sciences Division. In that capacity, she is responsible for conducting sensitive plant surveys, plant community identification and mapping, preparation of biological biological constraints and technical reports, and conservation analyses for target species as part of the preparation of large-scale conservation plans. She is also responsible for quality assurance and review of work completed by other DUDEK biologists, and for technical training of staff.

Ms. Vanderwier is authorized by the California Department of Fish and Game (pursuant to Sections 1907a and 2081a of the Fish and Game Code) to collect state-designated endangered, threatened, and rare plants .

PROFESSIONAL ASSIGNMENTS

Focused Surveys and Plant Community Mapping

- Botanist, and one of two team leaders, responsible for the coordination and conducting of focused surveys for the state-listed endangered San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina)* on approximately 6,000 acres at Newhall Ranch, Los Angeles County.

- Conducted field surveys and mapping of native grasslands on approximately 4,800 acres of Rancho Mission Viejo lands in Orange County. Surveys were concentrated in the areas of Chiquita, Cristianitos, and Upper and Lower Gabino Canyons.

- Conducted field surveys for state and federally listed, and MSCP-covered plant species, along with vegetation mapping, for over 1,000 acres of coastal sage and chaparral at Black Mountain City Park, Paraiso Cumbres, and Montaña Mirador, City of San Diego, Multiple Species Conservation Program (MSCP).

- Lead botanist responsible for conducting field surveys for sensitive, proposed, or listed plant species and the classification and mapping of vegetation for hundreds of projects throughout central and southern California (San Luis Obispo, Santa Barbara, Kern, Ventura, Orange, San Diego, Riverside, and Imperial counties).

- Conducted protocol surveys for listed plant and anostracan species as part of data collection for numerous vernal pool projects in San Diego and Riverside counties.

- Botanist, and one of two team leaders, providing botanical support during a five-week presence-absence survey for California gnatcatchers in Baja California, Mexico. Vegetation transect data were collected and analyzed for over 100 sites throughout the northern two-thirds of the peninsula.

- Conducted demographic studies and ecological data collection and analysis for the federally-listed endangered salt marsh bird's beak (*Cordylanthus maritimus* ssp. *maritimus*) at Mugu Lagoon, Ventura County, pursuant to a section 7 consultation with the U.S. Fish & Wildlife Service. Additional data was collected at Newport Back Bay, Orange County; Ormond Beach, Ventura County; Carpinteria Marsh, Santa Barbara County; and Sweetwater Marsh, San Luis Obispo County.

- Conducted protocol-level presence-absence surveys for the federally threatened coastal California gnatcatcher (*Polioptila californica californica*) and other sensitive coastal sage scrub species for numerous projects throughout Los Angeles, Orange, San Diego, San Bernardino, and Riverside Counties, and Baja California, Mexico.

- Conducted rare plant surveys, desert tortoise presence-absence surveys, and tortoise movement studies (radio-tracking) at Eagle Mountain and on Chuckawalla Bench (BLM lands), Riverside County.

- Participated in surveys for sensitive plants and wildlife (including island fox and island night lizard) on San Nicolas Island, and listed saltmarsh birds (including light-footed clapper, California least tern, and Belding's savannah sparrow) at Mugu Lagoon, Ventura County.

- Conducted field work and participated in the preparation of vegetation maps for the City of San Diego's pilot vegetation mapping for the Clean Water program.

Habitat Conservation Planning

- Lead staff biologist responsible for federal resource agency oversight in the preparation of the Multiple Habitats Conservation Plan (MHCP) and the City of Carlsbad's Habitat Management Plan (HMP).

- Assisted in the conservation analysis for 87 target species proposed for coverage in the MSCP (City and County of San Diego) pursuant to criteria necessary for the issuance of a section 10(a)(1)(B) permit pursuant to the federal Endangered Species Act (ESA).

- Participated in data collection and analysis in support of the identification of critical habitat for the coastal California gnatcatcher, San Diego fairy shrimp, Riverside fairy shrimp, and southern maritime chaparral plants. Provided input regarding existing conservation areas and strategies.

- Lead staff biologist responsible for resource agency oversight and permit processing for a single-species (California gnatcatcher) section 10(a)(1)(B) permit for a residential project in San Marcos, including preparation of all necessary NEPA documentation (*e.g.*, biological opinion, finding of no significant impact, statement of findings).

Habitat Restoration and Monitoring

- Assisted in the development of revegetation and monitoring programs for the First San Diego River Improvement Project (FSDRIP) as compensation for impacts to riparian and freshwater marsh habitats as a result of flood control measures along a one-mile reach of the San Diego River.
- Assisted in the collection and analysis of floral, faunal, and hydrological data for the Brown Parcel (Lopez Ridge) Vernal Pool Remediation Plan in Peñasquitos Canyon, Parcel C (Beazer) Vernal Pool Restoration Plan on Marine Corps Air Station (MCAS) Miramar, and vernal pools created by Caltrans along Highway 163 adjacent to MCAS Miramar.

TRAINING

Vegetation Rapid Assessment Method
California Native Plant Society
Julie Evens, CNPS Vegetation Ecologist
Location: Volcan Mountain, San Diego County, CA
Date: June 29, 2001

Measuring and Monitoring Plant Populations
Bureau of Land Management Course 1730-05
Drs. Caryl Elzinga, Dan Salzer, and John Willoughby
Location: Lake Tahoe, CA
Date: July 2000

Habitat Conservation Planning for Endangered Species
U.S. Fish & Wildlife Service
Location: Carlsbad, CA
Date: February 2000

Interagency Consultation (Section 7) for Endangered Species
U.S. Fish & Wildlife Service
Location: Carlsbad, CA
Date: January 2000

Anostracan (Fairy Shrimp) Identification Course Dr. Denton Belk
Location: Jones & Stokes, Sacramento, CA
Date: November, 1995

PUBLICATIONS

"Scrub Descriptions of the Baja California Peninsula, Mexico." Zippin, David B. and Vanderwier, Julie M. *Madroño* 41(2):85-119, 1994.

"Observations of Haustoria and Host Preference in *Cordylanthus maritimus* ssp. *maritimus* (Scrophulariaceae) at Mugu Lagoon, Ventura County, California." Newman, Judith C. and Vanderwier, Julie M. *Madroño* 31(1):185-186, 1984.

CATHLEEN M. WEIGAND
Botanist / Biologist

EDUCATION/REGISTRATION

- Humboldt State University
  B.S., Botany and Biology, 2000

- New Dawn Center (Finca Alba Nueva), San Isidro, Costa Rica
  Senior Thesis Study, 1997

PROFESSIONAL CERTIFICATIONS

- Certified Wetland Delineator (#2133) - Army Corps of Engineers Wetland Delineation & Management Training Program - 2002

- U.S.F.S. Wildland Firefighter Red Card Certified

EXPERIENCE SUMMARY

Ms. Weigand is a botanist/biologist with over three years experience in field studies, environmental document preparation, and habitat restoration and conservation. Project experience includes biological resource surveys, data collection and analysis, environmental assessments, wetland delineations, permitting, mitigation design, implementation and monitoring, and endangered and sensitive plant species surveys. Projects include issues relative to the California Coastal Act, the California Department of Fish and Game Code (Sections 1601 and 1603), and the federal Clean Water Act (Sections 401 and 404). Ms. Weigand has engaged in interagency coordination and public outreach efforts due to the complexities of each project. Her current role at Dudek & Associates includes biological resources assessment and impact analysis, wetland delineations and permitting, and habitat restoration and monitoring.

PROFESSIONAL ASSIGNMENTS

- Experience with seed and plant propagation.

- Greenhouse work (Humboldt State University- volunteer): watering, caring and maintenance of plants, re-potting/propagation, nomenclature of species housed in greenhouse, and preparation of species used for classroom and experimental purposes.

- Horticulture and nursery experience: watering, fertilizing, caring and maintenance of plants, propagation (plant cuttings, roots, and seeds), re-potting, installation and design of irrigation systems.

- Experience with growth chambers, preparation and implementation of fertilizers and composts, and the irrigation of greenhouses and farm properties.

- Riparian and wetland revegetation implementation.

- Seed and pollen collection.

- Supervising of farm and revegetation crews.
- Implementation of farm crops, community and personal gardens using sustainable agricultural practices.
- Revegetation and landscape design and implementation, monitoring, maintenance, and data collection.

TRICIA L. WOTIPKA
Environmental Specialist

EDUCATION

- Pennsylvania State University
  B.S. Wildlife and Fisheries Science (2000)
  (Dean's Honor List, Fall 1998 - Spring 2000)

PROFESSIONAL AFFILIATIONS

- Audobon Society, 2000

- Women's Environmental Council, past Secretary, 2001 and Newsletter Chair, 2002

EXPERIENCE SUMMARY

Ms. Wotipka has over two years experience in environmental document preparation and resource conservation planning. Project experience includes rare plant surveys, biological resource surveys, data collection and analysis, environmental assessments, wetlands delineations, permitting, mitigation design and monitoring, and endangered species surveys. Projects include issues relative to the California Fish and Game Code, the federal Clean Water Act (Sections 401 and 404), the National Environmental Policy Act (NEPA), the Migratory Bird Treaty Act, and the Endangered Species Act (ESA). Ms. Wotipka has also trained with the Wetlands Training Institute, Inc. and has successfully completed a course in basic wetlands delineation.

PROFESSIONAL ASSIGNMENTS

- **Sewer Line Relocation and Park Improvements.** Aliso Creek Emergency Sewer and Park Improvements Project, Orange County, California. Assisted in focused rare plant surveys for the federally-listed threatened and state-listed endangered thread-leaved brodiaea (*Brodiaea filifolia*). Prepared a Section 404 and 401 permit application in accordance with the federal Clean Water Act and a 1603 Streambed Alteration Agreement in accordance with California Fish and Game Code. Prepared and processed a Section 404 and 401 permit application in accordance with the federal Clean Water Act and a 1603 Streambed Alteration Agreement in accordance with California Fish and Game Code. Negotiated with resource agencies to identify appropriate mitigation measures, including the creation and enhancement of southern willow scrub and mule fat scrub wetlands within the reserve.

- **Railway Expansion Project.** Sorrento-Miramar Curve Realignment and Second Main Track Project. City of San Diego, California. Conducted field surveys for sensitive, state- and federally-listed plant species on approximately 190 acres.

- **Church Development Project.** St. Jerome's Catholic Church Project. City of San Diego, California. Conducted field surveys for state- and federally-listed species on approximately 18 acres.

- **Residential Subdivision and Roadway Improvements Project.** University Commons Development Project, City of San Marcos, California. Performed a delineation of "waters of the United States" and wetlands under the jurisdiction of the U.S. Army Corps of Engineers and California Department of Fish and Game. Prepared and processed a Section 404 and 401 permit application in accordance with the federal Clean Water Act and a 1603 Streambed Alteration Agreement in accordance with California Fish and Game Code.

- **Residential Subdivision.** Goodwin Drive Residential Development, City of Vista, California. Conducted a delineation of "waters of the United States" and wetlands under the jurisdiction of the U. S. Army Corps of Engineers (ACOE) and California Department of Fish and Game (CDFG). Obtained a Section 401 permit application in accordance with the federal Clean Water Act and a 1603 Streambed Alteration Agreement in accordance with California Fish and Game Code. Negotiated with resource agencies to identify appropriate mitigation measures, including the creation of southern willow scrub wetlands.

- **Conservation Planning.** Assisted in the development of the Multiple Species Habitat Conservation Plan (MSHCP) for western Riverside County. Project involvement included research on potentially covered plant species followed by syntheses of ecological information and the preparation of sensitive species conservation analysis.

RELEVANT EXPERIENCE

- Restoration/Maintenance volunteer - Habitat West, Vista, California. Assisted in the restoration and management of native habitats for the coastal California gnatcatcher.

- Restoration/Maintenance volunteer - Habitat West, Vista, California. Evaluated the health of newly planted vegetation; identified and removed pestilent species when necessary; identified shrubs and native scrub communities.

- Pennsylvania Cooperative Fish & Wildlife Service Unit. Flushed and recorded the location of ruffed grouse to note the effects of timber harvest on grouse management.

- Pennsylvania Wildlife Habitat Evaluation Project. Judged over 60 kids aged 8-18 years old in a multi-county wildlife evaluation competition in Pennsylvania.

- Pennsylvania Wildlife Habitat Evaluation Project. Evaluated students based on their knowledge of PA wildlife habitats, correct identification of wildlife foods, oral presentations, and on-site written management plans.

PUBLICATIONS

- Researched and prepared the introduction of the "Spring Creek Watershed Water Sampling Protocol" for the Clearwater Conservancy - Fall 1999.

- Designed and produced a web page in Spring 2000 (now out of service) entitled "Beaks and Buds". It was located at http://www.personal.psu. edu/tlw188.

APPENDIX B

VASCULAR PLANT SPECIES OBSERVED AT NEWHALL RANCH (2002)

APPENDIX B

VASCULAR PLANT SPECIES - NEWHALL RANCH

LYCOPODIAE

SELAGINELLACEAE - SPIKE-MOSS FAMILY
Selaginella bigelovii - Bigelow's spike-moss

EQUISETAE

EQUISETACEAE - HORSETAIL FAMILY
Equisetum laevigatum - smooth scouring-rush
Equisetum telmateia - giant horsetail

FILACEAE

AZOLLACEAE - MOSQUITO FERN FAMILY
Azolla filiculoides - duckweed fern

DENNSTAEDTIACEAE - BRAKEN FAMILY
Adiantum jordani - California maiden-hair
Pellaea andromedifolia var. *andromedifolia* - coffee fern
Pellaea mucronata var. *mucronata* - bird's-foot fern
Pentagramma triangularis - goldenback fern

POLYPODIACEAE - POLYPODY FAMILY
Polypodium californicum - California polypody

CONIFERAE

CUPRESSACEAE - CYPRESS FAMILY
* *Cedrus deodara* - Deodar cedar
Juniperus californica - California juniper

APPENDIX B (*Continued*)

PINACEAE - PINE FAMILY

* *Pinus halepensis* - Aleppo pine
* *Pinus pinea* – stone pine

ANGIOSPERMAE (DICOTYLEDONES)

AIZOACEAE - FIG-MARIGOLD FAMILY

* *Aptenia cordifolia* - baby sun-rose
* *Carpobrotus* sp. - sea-fig

AMARANTHACEAE - AMARANTH FAMILY

* *Amaranthus albus* - tumbleweed
Amaranthus blitoides - prostrate amaranth
* *Amaranthus hybridus* - amaranth
Amaranthus palmeri - Palmer's amaranth
Amaranthus powellii - Powell's amaranth
* *Amaranthus retroflexus* - rough pigweed

ANACARDIACEAE - SUMAC FAMILY

Malosma laurina - laurel sumac
Rhus ovata - sugar-bush
Rhus trilobata - squaw bush
* *Schinus molle* - Peruvian pepper-tree
Toxicodendron diversilobum - poison-oak

APIACEAE - CARROT FAMILY

* *Anethum graveolens* - dill
Apiastrum angustifolium - wild celery
* *Apium graveolens* - celery
Berula erecta - cutleaf water-parsnip
* *Coriandrum sativum* - cilantro
Lomatium utriculatum - common lomatium

APOCYNACEAE - DOGBANE FAMILY

Apocynum cannabinum - Indian hemp
* *Vinca major* - periwinkle

APPENDIX B (*Continued*)

ASCLEPIADACEAE - MILKWEED FAMILY

Asclepias fascicularis - narrow-leaf milkweed

ASTERACEAE - SUNFLOWER FAMILY

Achillea millefolium - yarrow
Acourtia microcephala - sacapellote
Ambrosia acanthicarpa - annual burweed
Ambrosia confertifolia - weak-leaved burweed
Ambrosia psilostachya - western ragweed
Artemisia californica - coastal sagebrush
Artemisia douglasiana - California mugwort
Artemisia dracunculus - tarragon
Artemisia tridentata - Great Basin sagebrush
Baccharis douglasii - marsh baccharis
Baccharis pilularis - coyote brush
Baccharis salicifolia - mule fat
Baccharis sarothroides - chaparral broom
Brickellia californica - California brickellbush
Brickellia nevinii - Nevin's brickellbush
* *Carduus pycnocephalus* - Italian thistle
* *Centaurea melitensis* - star thistle
Chaenactis glabriuscula - yellow pincushion
* *Chrysothamnus nauseosus* - rubber rabbitbrush
Cirsium occidentale var. *californicum*- California thistle
Cirsium occidentale var. *occidentale*- cobwebby thistle
* *Cirsium vulgare* - bull thistle
* *Cnicus benedictus* - blessed thistle
Conyza canadensis - horseweed
Conyza coulteri - Coulter's conyza
* *Cotula coronopifolia* - African brass-buttons
Encelia actoni - Acton's encelia
Encelia californica - California bush sunflower
Encelia farinosa - brittlebush, incensio
Ericameria palmeri var. *pachylepis* - goldenbush
Ericameria pinifolia - pine-bush

APPENDIX B (*Continued*)

Erigeron foliosus - leafy daisy
Eriophyllum confertiflorum - long-stem golden yarrow
Euthamia occidentalis - western goldenrod
Filago californica - California fluffweed
* *Filago gallica* - narrow-leaf filago
Gnaphalium bicolor - bicolor cudweed
Gnaphalium californicum - California everlasting
Gnaphalium canescens ssp. *microcephalum* - white everlasting
* *Gnaphalium luteo-album* - white cudweed
Gnaphalium palustre - lowland cudweed
Hazardia squarrosa ssp. *grindelioides* - saw-toothed goldenbush
Helianthus annuus - common sunflower
Helianthus nuttallii c.f. ssp. *parishii* - Los Angeles sunflower
Hemizonia fasciculata - fascicled tarweed
Heterotheca grandiflora - telegraph weed
Heterotheca sessiliflora - golden aster
Isocoma menziesii - goldenbush
Iva axillaris - poverty weed
* *Lactuca serriola* - prickly lettuce
Lasthenia californica - coast goldfields
Lepidospartum squamatum - scale-broom
Lessingia filaginifolia - virgate cudweed aster
Lessingia glandulifera - lessingia
Malacothrix saxatilis - cliff malacothrix
* *Matricaria matricarioides* - pineapple weed
Micropus californicus - slender cottonweed
Pluchea odorata - marsh-fleabane
Pluchea sericea - arrow weed
* *Pulicaria paludosa* - Spanish sunflower
Rafinesquia californica - California chicory
Senecio flaccidus var. *douglasii* - butterweed
* *Senecio vulgaris* - common groundsel
* *Silybum marianum* - milk thistle
* *Sonchus asper* - prickly sow-thistle
* *Sonchus oleraceus* - common sow-thistle

APPENDIX B (*Continued*)

Stephanomeria exigua - small wreathplant
Stephanomeria pauciflora - wire-lettuce
Stephanomeria virgata - twiggy wreathplant
Stylocline gnaphaloides - everlasting nest-straw
Wyethia ovata - mule ears
Xanthium spinosum - spiny cocklebur
Xanthium strumarium - cocklebur

BORAGINACEAE - BORAGE FAMILY

Amsinckia menziesii - yellow fiddleneck
Cryptantha sp. - forget-me-not
Cryptantha intermedia - common forget-me-not
Heliotropium curassavicum - wild heliotrope
Pectocarya linearis - slender pectocarya
Pectocarya penincillata - pectocarya
Pectocarya setosa - pectocarya
Plagiobothrys arizonicus - popcorn flower
Plagiobothrys canescens - rusty popcorn flower

BRASSICACEAE - MUSTARD FAMILY

* *Brassica nigra* - black mustard
* *Capsella bursa-pastoris* - shepard's purse
* *Hirschfeldia incana* - short-podded mustard
Lepidium lasiocarpum - peppergrass
* *Lepidium latifolium* - peppergrass
Lepidium virginicum - wild peppergrass
* *Raphanus sativus* - wild radish
* *Rorippa nasturtium-aquaticum* - water cress
* *Sisymbrium altissimum* - tumble mustard
* *Sisymbrium irio* - London rocket
* *Sisymbrium officinale* - hedge mustard
* *Sisymbrium orientale* - Oriental mustard
Thysanocarpus curvipes - fringepod

APPENDIX B (*Continued*)

CACTACEAE - CACTUS FAMILY

* *Cereus peruvianus* - Peruvian apple cactus
Opuntia basilaris var. *brachyclada* - short-joint beavertail
Opuntia californica var. *parkeri* - cane cholla
Opuntia littoralis - coastal prickly-pear
* *Trichocereus spachianus* - golden torch cactus

CAPPARACEAE - CAPER FAMILY

Isomeris arborea - bladderpod

CAPRIFOLIACEAE - HONEYSUCKLE FAMILY

Lonicera subspicata - southern honeysuckle
Sambucus mexicana - Mexican elderberry
Symphoricarpos c.f. mollis - spreading snowberry

CARYOPHYLLACEAE - PINK FAMILY

* *Cerastium glomeratum* - sticky mouse-ear
* *Herniaria cinerea* - gray herniaria
Loeflingia squarrosa - no common name
* *Silene gallica* - common catchfly
Spergularia sp. - stickwort, starwort
* *Spergularia rubra* - sand-spurrey
* *Spergularia c.f. villosa* - villous sand-spurrey
* *Stellaria media* - common chickweed

CASURINACEAE – SHEET OAK FAMILY

* *Casuarina cunninghamiana* - Austrailian Pine

CHENOPODIACEAE - GOOSEFOOT FAMILY

Atriplex canescens - four-winged saltbush
* *Atriplex heterosperma* - weedy orache
Atriplex lentiformis- big saltbush, quail brush
* *Atriplex rosea* - tumbling oracle
* *Atriplex semibaccata* - Australian saltbush
Atriplex serenana var. *serenana* - bractscale

APPENDIX B (*Continued*)

Atriplex suberecta - Australian saltbush
Atriplex triangularis - spearscale
* *Bassia hyssopifolia* - five-hooked bassia
* *Chenopodium album* - lamb's-quarters
* *Chenopodium ambrosioides* - Mexican tea
Chenopodium berlandieri - pitseed goosefoot
* *Chenopodium botrys* - goosefoot
Chenopodium californicum - California goosefoot
* *Chenopodium murale* - nettle-leaved goosefoot
Chenopodium rubrum - red goosefoot
* *Salsola tragus* - Russian-thistle

CONVOLVULACEAE - MORNING-GLORY FAMILY
Calystegia peirsonii - Peirson's morning-glory
* *Convolvulus arvensis* - bindweed

CRASSULACEAE - STONECROP FAMILY
Crassula connata - dwarf stonecrop
Dudleya cymosa - unidentified dudleya
Dudleya lanceolata - lanceleaf dudleya

CUCURBITACEAE - GOURD FAMILY
Cucurbita foetidissima - coyote-melon, calabazilla
Marah macrocarpus - wild cucumber

CUSCUTACEAE - DODDER FAMILY
Cuscuta californica - California dodder
Cuscuta subinclusa - dodder

DATISCACEAE - DASTICA FAMILY
Dastica glomerata - Durango root

ERICACEAE - HEATH FAMILY
Arctostaphylos glauca - bigberry manzanita

APPENDIX B (*Continued*)

EUPHORBIACEAE - SPURGE FAMILY

Chamaesyce albomarginata - rattlesnake spurge
Chamaesyce polycarpa - small-seed sand mat
Croton californicus - California croton
Eremocarpus setigerus - doveweed
* *Ricinus communis* - castor-bean
Stillingia linearifolia - linear-leaved stillingia

FABACEAE - PEA FAMILY

* *Acacia baileyana* - golden wattle
Astragalus trichopodus - Santa Barbara locoweed
Glycyrrhiza lepidota - wild licorice
Lathyrus laetiflorus - wild sweet pea
Lathyrus vestitus - wild pea
* *Lotus corniculatus* - bird's-foot lotus
Lotus humistratus - lotus
Lotus purshianus - Spanish-clover
Lotus salsuginosus - coastal lotus
Lotus scoparius - deerweed
Lotus strigosus - strigose deerweed
Lupinus bicolor - Lindley's annual lupine
Lupinus excubitus var. *hallii* - grape soda lupine
Lupinus hirsutissimus - stinging lupine
Lupinus microcarpus - chick lupine
Lupinus sparsiflorus - Coulter's lupine
Lupinus succulentis - arroyo lupine
Lupinus truncatus - collar lupine
* *Medicago polymorpha* - California burclover
* *Medicago polymorpha* var. *brevispina* - short-spined California burclover
* *Medicago sativa* - alfalfa
* *Melilotus alba* - white sweet-clover
* *Melilotus indica* - yellow sweet-clover
* *Robinia pseudoacacia* - black locust
Trifolium sp. - clover
* *Trifolium fragiferum* - strawberry clover

APPENDIX B (*Continued*)

* *Trifolium hirtum* - rose clover
* *Trifolium repens* - white clover

FAGACEAE - BEECH FAMILY

Quercus agrifolia - coast live oak
Quercus berberidifolia - scrub oak
Quercus douglasii - blue oak
Quercus lobata - valley oak

GERANIACEAE - GERANIUM FAMILY

* *Erodium cicutarium* - red-stemmed filaree
* *Erodium botrys* - filaree

GROSSULARIACEAE - CURRANT FAMILY

Ribes aureum - golden currant
Ribes malvaceum - chaparral currant

HYDROPHYLLACEAE - WATERLEAF FAMILY

Emmenanthe penduliflora - whispering bells
Eriodictyon crassifolium var. *nigrescens* - yerba santa
Eucrypta chrysanthemifolia - common eucrypta
Phacelia cicutaria - caterpillar phacelia
Phacelia distans - blue fiddleneck
Phacelia imbricata - imbricate phacelia
Phacelia minor - wild canterbury-bell
Phacelia ramosissima - shrubby phacelia

JUGLANDACEAE - WALNUT FAMILY

Juglans californica - southern California black walnut

LAMIACEAE - MINT FAMILY

* *Marrubium vulgare* - horehound
Mentha citrata – orange mint
Salvia apiana - white sage
Salvia columbariae - chia

APPENDIX B (*Continued*)

Salvia leucophylla - purple sage
Salvia mellifera - black sage
Stachys ajugoides var. *rigida* - rigid hedge-nettle
Stachys albens - white hedge-nettle
Trichostema lanceolatum - vinegar weed

LAURACEAE - LAUREL FAMILY
Umbellularia californica - California laurel

LOASACEAE - STICK-LEAF FAMILY
Mentzelia laevicaulis - blazing star
Mentzelia micrantha - small-flowered stick-leaf

LYTHRACEAE - LOOSESTRIFE FAMILY
Lythrum californicum - California loosestrife

MALVACEAE - MALLOW FAMILY
Malacothamnus fasciculatus - mesa bushmallow
* *Malva neglecta* - common mallow
* *Malva parviflora* - cheeseweed

MELIACEAE - MAHOGANY FAMILY
* *Melia azedarach* - China berry

MORACEAE - FIG FAMILY
* *Ficus carica* - fig

MYRTACEAE - MYRTLE FAMILY
* *Eucalyptus globulus* - blue gum
* *Eucalyptus leucoxylon* - white ironbark
* *Eucalyptus sideroxylon* - red ironbark

NYCTAGINACEAE - FOUR O'CLOCK FAMILY
Mirabilis californica - California wishbone-bush

APPENDIX B (*Continued*)

OLEACEAE - OLIVE FAMILY

Fraxinus dipetala - California ash
* *Fraxinus uhdei* – tropical ash
* *Ligustrum lucidum* - glossy privet
* *Olea europaea* - mission olive

ONAGRACEAE - EVENING-PRIMROSE FAMILY

Camissonia boothii - sun cup
Camissonia californica - mustard primrose
Camissonia hirtella - sun cup
Camissonia strigulosa - sun cup
Clarkia purpurea - winecup clarkia
Clarkia speciosa - clarkia
Clarkia unguiculata - elegant clarkia
Epilobium brachycarpum - willow herb
Epilobium canum - California fuchsia
Epilobium ciliatum - California cottonweed
Ludwigia peploides - yellow waterweed
Ludwigia repens - water primrose
Oenothera elata - evening primrose

OROBANCHACEAE - BROOM-RAPE FAMILY

Orobanche parishii - broom-rape

PAEONIACEAE - PEONY FAMILY

Paeonia californica - California peony

PAPAVERACEAE - POPPY FAMILY

Eschscholzia californica - California poppy

PLANTAGINACEAE - PLANTAIN FAMILY

Plantago erecta - dot-seed plantain
* *Plantago indica* - plantain
* *Plantago lanceolata* - English plantain
* *Plantago major* - common plantain

APPENDIX B (*Continued*)

PLATANACEAE - SYCAMORE FAMILY

Platanus racemosa - western sycamore

POLEMONIACEAE - PHLOX FAMILY

Eriastrum densifolium ssp. *mohavense* - Mohave eriastrum
Eriastrum sapphirinum - sapphire eriastrum
Gilia angelensis - angel gilia
Leptodactylon californicum - prickly phlox
Linanthus pygmaeus - linanthus
Navarretia atractyloides - holly-leaf skunkweed

POLYGONACEAE - BUCKWHEAT FAMILY

Chorizanthe parryi var. *fernandina* - San Fernando Valley spineflower
Chorizanthe staticoides - turkish rugging
Eriogonum sp. #1 - buckwheat
Eriogonum sp. #2 - buckwheat
Eriogonum elongatum - long-stemmed buckwheat
Eriogonum fasciculatum ssp. *foliolosum* - California buckwheat
Eriogonum gracile - slender woolly buckwheat
Eriogonum viridescens - buckwheat
Lastarriaea coriacea - lastarriaea
* *Polygonum arenastrum* - common knotweed
* *Polygonum argyrocoleon* - smartweed
Polygonum lapathifolium - willow weed
Polygonum punctatum - perennial smartweed
* *Rumex conglomeratus* - whorled dock
* *Rumex crispus* - curly dock
Rumex hymenosepalus - wild rhubarb
Rumex obtusifolius - dock
Rumex salicifolius - willow dock

PORTULACACEAE - PURSLANE FAMILY

Calandrinia ciliata - redmaids
Claytonia parviflora - small-leaved montia
* *Portulaca oleracea* - common purslane

APPENDIX B (*Continued*)

RANUNUCULACEAE - BUTTERCUP FAMILY

Clematis ligusticifolia - yerba de chiva

RHAMNACEAE - BUCKTHORN FAMILY

Ceanothus crassifolius - hoary-leaved ceanothus
Rhamnus crocea - redberry
Rhamnus ilicifolia - holly-leaf redberry

ROSACEAE - ROSE FAMILY

Adenostoma fasciculatum - chamise
Cercocarpus betuloides var. *betuloides* - birch-leaf mountain-mahogany
Cercocarpus betuloides var. *blancheae* - island mountain-mahogany
Heteromeles arbutifolia - toyon
Prunus ilicifolia - holly-leaf cherry
Rosa californica - California rose
Rubus ursinus - California blackberry
* *Sangwisorba minor* – garden burnet

RUBIACEAE - MADDER FAMILY

Galium angustifolium - narrow-leaved bedstraw
* *Galium aparine* - goose grass
Galium porrigens - climbing bedstraw

SALICACEAE - WILLOW FAMILY

Populus fremontii - Fremont's cottonwood
Salix exigua - narrow-leaved willow
Salix gooddingii - black willow
Salix laevigata - red willow
Salix lasiolepis - arroyo willow
Salix lucida ssp. *lasiandra* - golden willow

SAURURACEAE - LIZARD'S-TAIL FAMILY

Anemopsis californica - yerba mansa

APPENDIX B (*Continued*)

SCROPHULARIACEAE - FIGWORT FAMILY

Antirrhinum coulterianum - white snapdragon
Castilleja affinis - coast paintbrush
Castilleja densiflora - dense-flowered owl's-clover
Castilleja exserta - common owl's-clover
Castilleja foliolosa - woolly Indian paintbrush
Keckiella cordifolia - heart-leaf penstemon
Linaria canadensis - toadflax
Mimulus aurantiacus - bush monkeyflower
Mimulus guttatus - seep monkeyflower
Penstemon centranthifolius - scarlet bugler
* *Verbascum thapsus* - woolly mullein
* *Verbascum virgatum* - wand mullein
* *Veronica anagallis-aquatica* - water speedwell

SIMAROUBACEAE - QUASSIA FAMILY

* *Ailanthus altissima* - tree of heaven

SOLANACEAE - NIGHTSHADE FAMILY

* *Datura wrightii* - western jimsonweed
* *Nicotiana glauca* - tree tobacco
* *Solanum americanum* - small-flowered nightshade
Solanum douglasii - white nightshade
* *Solanum eleagnifolium* - silver leaf horse-nettle
* *Solanum sarrachoides* - hairy nightshade
Solanum xanti - chaparral nightshade

TAMARICACEAE - TAMARISK FAMILY

* *Tamarix* sp. - tamarisk

ULMACEAE - ELM FAMILY

* *Ulmus pumila* - Siberian elm

APPENDIX B (*Continued*)

URTICACEAE - NETTLE FAMILY

Urtica dioica - giant creek nettle
* *Urtica urens* - dwarf nettle

VERBENACEAE - VERVAIN FAMILY

Verbena lasiostachys - western verbena

VISCACEAE - MISTLETOE FAMILY

Phoradendron macrophyllum - big leaf mistletoe
Phoradendron villosum - oak mistletoe

VITACEAE - GRAPE FAMILY

Parthenocissus vitacea - woodbine, Virginia creeper
Vitis girdiana - desert wild grape

ZYGOPHYLLACEAE - CALTROP FAMILY

* *Tribulus terrestris* - puncture vine

ANGIOSPERMAE (MONOCOTYLEDONES)

ARECACEAE - PALM FAMILY

* *Washingtonia robusta* - Mexican fan palm

CYPERACEAE - SEDGE FAMILY

Carex sp. - sedge
Cyperus eragrostis - tall cyperus
Cyperus esculentus - yellow nut-grass
* *Cyperus involucratus* - nutsedge
Cyperus odoratus - coarse cyperus
Eleocharis montevidensis - slender creeping spike-rush
Eleocharis parishii - spike-rush
Scirpus acutus - hard-stemmed bulrush
Scirpus americanus - winged three-square
Scirpus microcarpus - bulrush
Scirpus robustus - Pacific coast bulrush

APPENDIX B (*Continued*)

JUNCACEAE - RUSH FAMILY

Juncus balticus - wire rush
Juncus bufonius - toad rush
Juncus longistylis - rush
Juncus rugulosus - wrinkled rush
Juncus textilis - Indian rush
Juncus torreyi - rush
Juncus xiphioides - iris-leaved rush

LEMNACEAE - DUCKWEED FAMILY

Lemna valdiviana - duckweed

LILIACEAE - LILY FAMILY

* *Allium cepa* - onion
Allium porrum - onion
* *Amaryllis bella-donna* - naked lady
* *Asparagus officinalis* - asparagus
Brodiaea terrestris ssp. *kernensis* - brodiaea
Calochortus clavatus - club-haired mariposa lily
Calochortus venustus - mariposa lily
Dichelostemma capitatum - blue dicks
Muilla maritima - common muilla
Yucca whipplei – Our Lord's candle

POACEAE - GRASS FAMILY

Achnatherum coronatum - giant needlegrass
* *Agrostis* sp. - bentgrass
* *Agrostis viridis* - water bent
* *Arundo donax* - giant reed
* *Avena barbata* - slender oat
* *Avena fatua* - wild oat
Bromus catharticus - California brome
* *Bromus diandrus* - ripgut grass
* *Bromus hordeaceus* - soft chess
* *Bromus madritensis* ssp. *rubens* - foxtail chess

APPENDIX B (*Continued*)

* *Bromus tectorum* - cheat grass
* *Cortaderia jubata* - pampas grass
* *Crypsis schoenoides* - prickle grass
* *Cynodon dactylon* - Bermuda grass
* *Digitaria sanguinalis* - hairy crabgrass
Distichlis spicata - salt grass
* *Echinochloa colonum* - jungle-rice
* *Echinochloa crus-galli* - barnyard grass
Elymus glaucus - western wild rye
Eragrostis mexicana - lovegrass
* *Festuca arundinacea* - tall fescue
* *Hordeum marinum* - Mediterranean barley
* *Hordeum murinum* - glaucous foxtail barley
* *Lamarckia aurea* - goldentop
* *Leptochloa uninerva* - Mexican sprangletop
Leymus condensatus - giant ryegrass
Leymus triticoides - beardless wild rye
Leptichloa uninervia - Mexican sprangletop
* *Lolium perenne* - perennial ryegrass
Melica imperfecta - California melic
Muhlenbergia microsperma - littleseed muhly
Nassella cernua - nodding needlegrass
Nassella lepida - foothill needlegrass
Paspalum distichum - knotgrass
* *Phalaris minor* - Mediterranean canary grass
* *Piptatherum miliaceum* - smilo grass
* *Poa annua* - annual bluegrass
Poa secunda - Malpais bluegrass
* *Polypogon interruptus* - ditch beard grass
* *Polypogon monspeliensis* - rabbit's-foot grass
* *Schismus barbatus* - abumashi
* *Sorghum halepense* - Johnsongrass
* *Vulpia myuros* - rattail fescue
Vulpia octoflora - six-weeks fescue

APPENDIX B (*Continued*)

POTAMOGETONACEAE - PONDWEED FAMILY
Potamogeton foliosus - leafy pondweed

TYPHACEAE - CATTAIL FAMILY
Typha domingensis - slender cattail
Typha latifolia - broad-leaved cattail

* signifies introduced (non-native) species

APPENDIX C

CALIFORNIA NATURAL DIVERSITY DATABASE FORMS

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
Copy Sent To _____

PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU. USE THE BACK FOR COMMENTS IF NECESSARY. ***PLEASE ATTACH OR DRAW A MAP ON BACK.***

Scientific name (no codes): *Chorizanthe parryi* var. *fernandina*

Reporter: Mark A. Elvin, Julie Vanderwier Phone: (760) 942.5147

Address: DUDEK & Associates, 605 Third Street, Encinitas, CA 92024

Date of Field Work: 06 Jun 2002 County: Los Angeles Collection: If yes, # Mus./Herb:

Location: Northern Santa Susana Mountains, Newhall Ranch, southeast of confluence of the Santa Clara River and Castaic Creek, east, south, and west edges of Airport Mesa and adjacent mesas.

Quad Name: Newhall T 4N R 16W W ¼ of W ¼ Sec3
X 7½' __ 15' Elevation: 1075-1250' T 4N R 17W E ¼ of E ¼ Sec3

Landowner/Manager: The Newhall Land and Farming Company, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? X Yes ____ No If not, reason:

Is this a new location record? ____ Yes X* No ____ Unknown * surveys performed here in 2001 by FLx; species believed identified during those surveys

Total # of Individuals = ~300 plants (2002); ~20,000 plants (pre-2002) Is this a subsequent visit? __ Yes X No Compared to your last visit: __ more __ same __ fewer

Phenology (plants): ____ % vegetative 2 % flowering 98 % fruiting

Population Age Structure (animals): ____ # adults ____ # juveniles ____ # others

Site Function for Species (animals): ____ breeding ____ foraging ____ wintering ____ roosting ____ denning ____ other

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

Zamora clay loam and terrace escarpment soils; ridges and slopes down from mesa tops and from agricultural areas. Primarily on southeast- to south- to southwest-facing slopes with macro-slope gradients typically ranging between 5 degrees and 35 degrees; micro-slope gradients are typically slightly shallower (2 degrees to 20 degrees), but are locally steeper. Soils color is generally brown (10YR 5/3). Venturan coastal sage scrub with *Artemisia californica, Eriogonum fasciculatum, E. elongatum, E. gracile, Salvia leucophylla, Ericameria palmeri* var. *pachypus, Mirabilis californica.*

Current Land Use/Visible Disturbances/Possible Threats: Current Land Use: Cattle grazing, farming; Visible Disturbances: cattle grazing, farming, grading/clearing; Possible Threats: proposed residential/commercial development.

Overall Site Quality: ____ Excellent X Good ____ Fair ____ Poor

Comments: Surveys were conducted until September 2002. The rainfall for this growing year was ~one-third of the normal.

Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

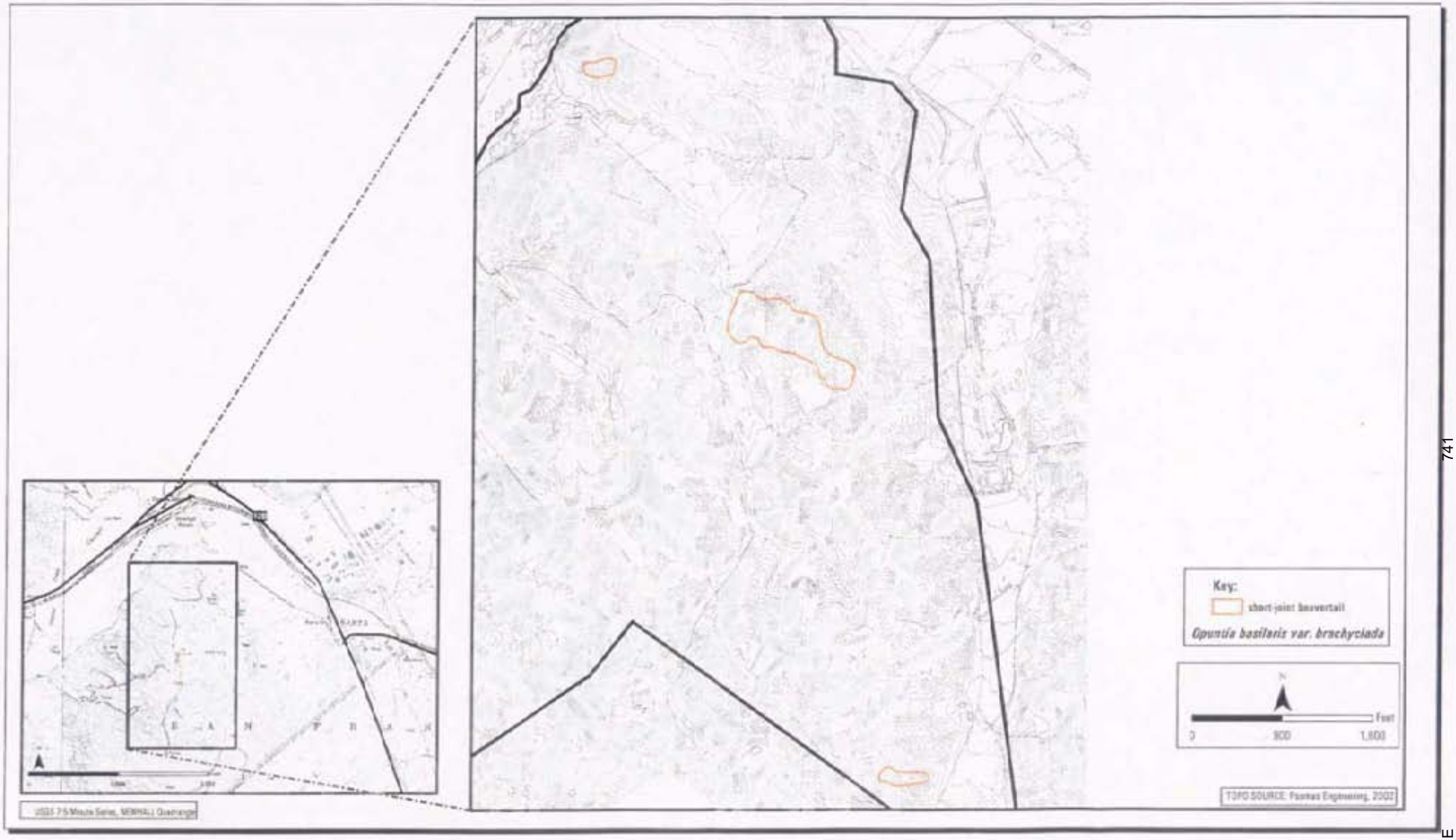
X Keyed in a site reference:
X Compared with specimen housed at: UCR
____ Compared with photo/drawing in:
X By another person (name): Andy Sanders, Rick Riefner
X Other: compared with materials identified by CDFG in May 2002 and documented occurrence on Grapevine Mesa [EO 14]

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone) Kim Marsden

PHOTOGRAPHS (Check one or more)

Subject	Type
X Plant/Animal	X Slide
X Habitat	____ Print
X Diagnostic Feature	
____ Other	

May we obtain duplicates **at our cost**?
X Yes ____ No



Newhall Ranch

2002 short-joint beavertail - Airport Mesa Area

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

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Copy Sent To _____

PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU. USE THE BACK FOR COMMENTS IF NECESSARY. ***PLEASE ATTACH OR DRAW A MAP ON BACK.***

Scientific name (no codes): *Chorizanthe parryi* var. *fernandina*

Reporter: Mark Elvin & Julie Vanderwier Phone: (760) 942-5147

Address: DUDEK & Associates, 605 Third Street, Encinitas, CA 92024

Date of Field Work: County: Los Angeles Collection: yes If yes, # Mus./Herb:

Location: Northern Santa Susana Mountains, Newhall Ranch, south of confluence of the Santa Clara River and Castaic Creek, south and western edge of Grapevine Mesa.

Quad Name: Val Verde
_X_ 7½' __ 15' Elevation: 1040-1290' T 17W R 4N ____ ¼ o ____ ¼ Sec____

Landowner/Manager: The Newhall Land and Farming Company, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? _X_ Yes ____ No If not, reason:

Is this a new location record? _X*_ Yes ____ No ____ Unknown [*some new polygons were located near extant EO 14]

Total # of Individuals = ~5,000plants (2002); ~200,000 plants (pre-2002) Is this a subsequent visit?__ Yes_X No Compared to your last visit: __ more __ same __ fewer

Phenology (plants): ____ % vegetative _~3_ % flowering* _~97_ % fruiting** *2002 plants ** pre-2002 plants

Population Age Structure (animals): ____ # adults ____ # juveniles ____ # others

Site Function for Species (animals): ____ breeding ____ foraging ____ wintering ____ roosting ____ denning ____ other

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

Zamora clay loam and terrace escarpment soils; west side of the mesa immediately adjacent to, and downslope of, agricultural areas. Primarily on south- to southwest-facing slopes with macro-slope gradients typically ranging between 8 degrees and 35 degrees; micro-slope gradients are typically slightly shallower (2 degrees to 16 degrees), but are locally steeper, particularly at two locations where plants were observed on the eroded banks of a dry creek (slope gradients 60 to 68 degrees). Soils color is generally brown (10YR 5/3)Venturan coastal sage scrub with *Artemisia californica, Eriogonum fasciculatum, E. elongatum, E. gracile, Salvia leucophylla, Ericameria palmeri* var. *pachypus, Mirabilis californica*

Current Land Use/Visible Disturbances/Possible Threats: Current Land Use: Cattle grazing, farming; Visible Disturbances: cattle grazing, farming; Possible Threats: proposed residential/commercial development.

Overall Site Quality: ____ Excellent _X_ Good ____ Fair ____ Poor

Comments: Surveys were conducted until September 2002. The rainfall for this growing year was ~one-third of the normal.

Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

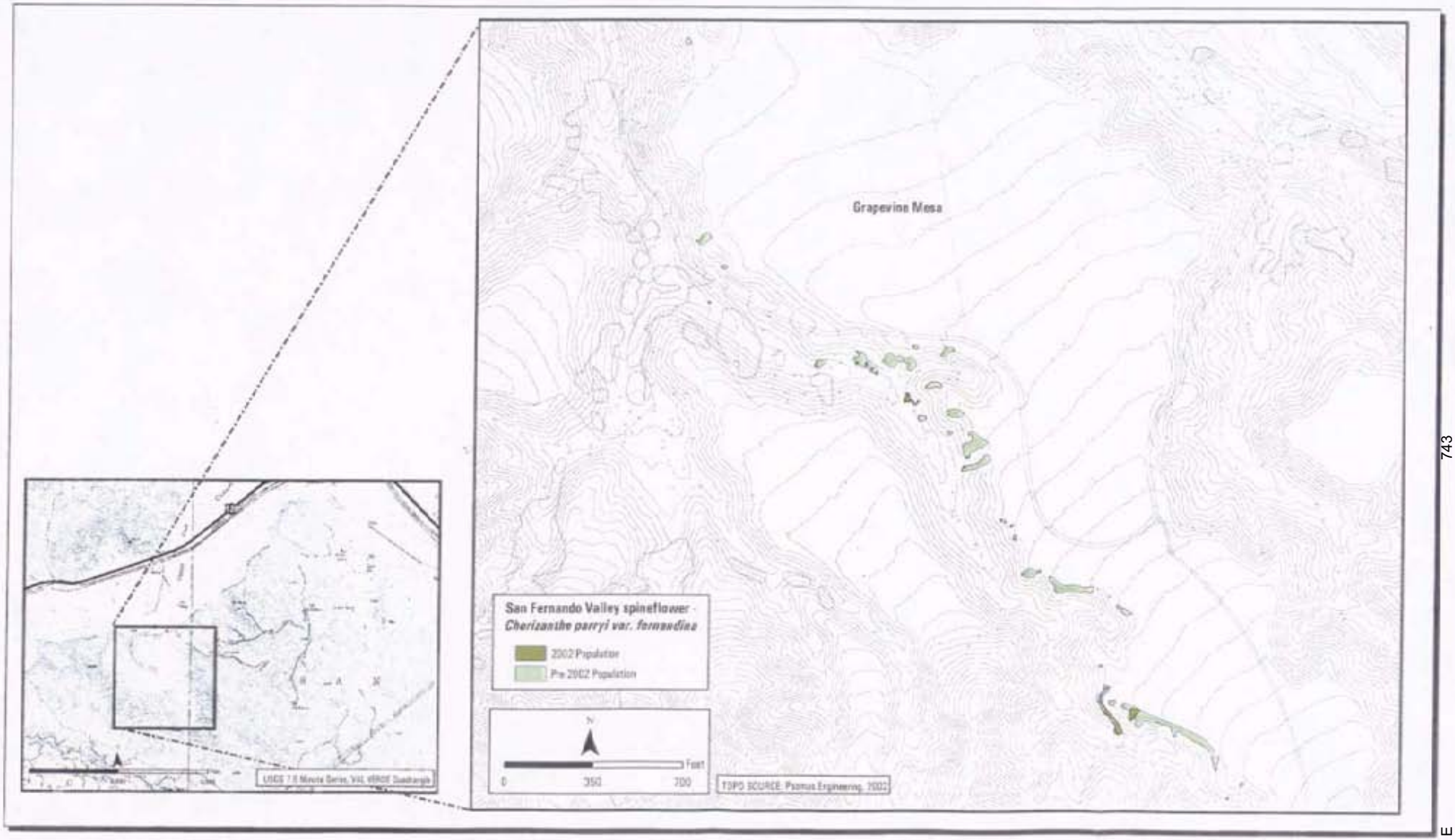
_X_ Keyed in a site reference:
_X_ Compared with specimen housed at:
____ Compared with photo/drawing in:
_X_ By another person (name): Andy Sanders, Rick Riefner
_X_ Other: compared with materials identified by CDFG in May 2002 and documented occurrence on Grapevine Mesa [EO 14]

PHOTOGRAPHS (Check one or more)

Subject	Type
_X_ Plant/Animal	_X_ Slide
_X_ Habitat	____ Print
_X_ Diagnostic Feature	
____ Other	

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone) Kim Marsden, Rick Riefner

May we obtain duplicates **at our cost?** _X_ Yes ____ No



Newhall Ranch

2002 San Fernando Valley spineflower - Grapevine Mesa Area

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
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PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU. USE THE BACK FOR COMMENTS IF NECESSARY. ***PLEASE ATTACH OR DRAW A MAP ON BACK.***

Scientific name (no codes): *Chorizanthe parryi* var. *fernandina*

Reporter: Mark A. Elvin, Julie Vanderwier Phone: (760) 942.5147

Address: DUDEK & Associates, 605 Third Street, Encinitas, CA 92024

Date of Field Work: July & August 2002 County: Los Angeles Collection: yes If yes, # Elvin 2138 Mus./Herb: UCR

Location: Northern Santa Susana Mountains, Newhall Ranch: north of State Route 126, west of San Martinez Grande Canyon Road

Quad Name: Val Verde T 17W R 4W ____ ¼ of ____ ¼ Sec 20
X 7½' __ 15' Elevation: 1090-1235' T ____ R ____ ____ ¼ o ____ ¼ Sec ____

Landowner/Manager: The Newhall Land and Farming Company, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? X Yes ____ No If not, reason:

Is this a new location record? X* Yes ___ No ____ Unknown * surveys performed here in 2001 by FLx; species believed identified during those surveys

Total # of individuals = ~50 plants (2002); ~1,050,000 plants (pre-2002) Is this a subsequent visit? __ Yes X No Compared to your last visit: __ more __ same __ fewer

Phenology (plants): ____ % vegetative <1 % flowering 99 % fruiting (pre-2002 inflorescences)

Population Age Structure (animals): ____ # adults ____ # juveniles ____ # others

Site Function for Species (animals): ____ breeding ____ foraging ____ wintering ____ roosting ____ denning ____ other

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

Elevated slopes and rounded ridge tops underlain by a large ancient landslide that involves bedrock of the marine Pico Formation; soil unit (per Antelope Valley Soil Survey (USDA 1969) is eroded Castaic-Balcom silty clay loam (CmF2), with the organic (O) soil horizon generally absent. Dry Munsell soil color is typically brown (10YR 5/3) and varies from grayish-brown (10YR 5/2) to pale brown (10YR 6/3). Slopes faced to the south or east with bearing ranging from S80W to N78E. Macro-slope gradients range from 5 degrees to 33 degrees, with micro-slope gradients being generally shallower (1 degree to 20 degrees). The substrate is undisturbed; however, extensive cattle grazing has occurred in the past. Vegetation is open Venturan coastal scrub composed of *Salvia leucophylla, Artemisia californica, Eriogonum fasciculatum, E. elongatum, E. gracile, Sambucus mexicana.*

Current Land Use/Visible Disturbances/Possible Threats: Current Land Use: Cattle grazing, farming; Visible Disturbances: cattle grazing, fire in recent past (5-10 years); Possible Threats: Currently proposed for estate residential development.

Overall Site Quality: ____ Excellent X Good ____ Fair ____ Poor

Comments: Surveys were conducted until September 2002. The rainfall for this growing year was ~one-third of the normal.

Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

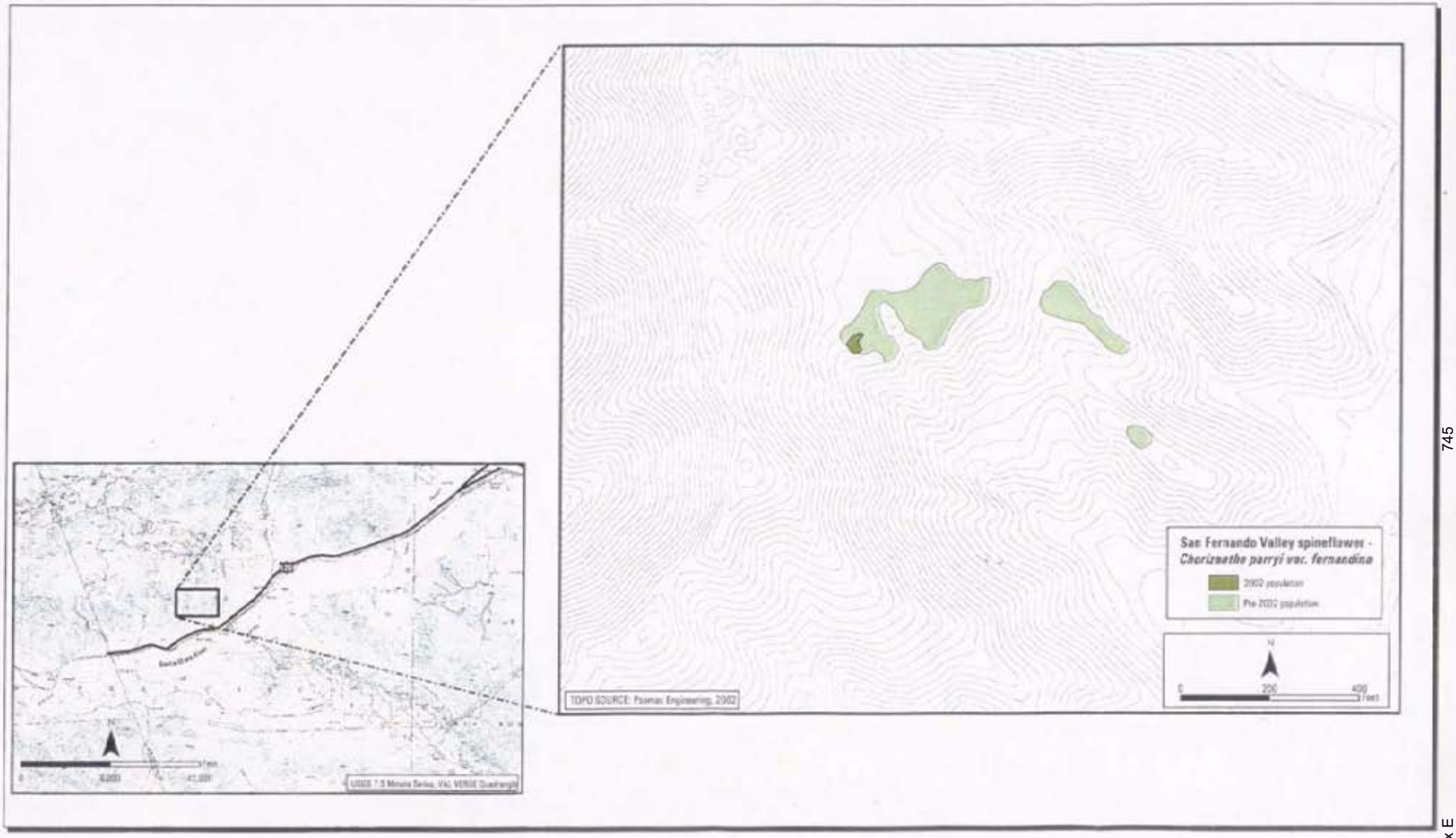
X Keyed in a site reference: Hickman 1993
X Compared with specimen housed at: UCR
____ Compared with photo/drawing in:
X By another person (name): Andy Sanders
X Other: compared with materials identified by CDFG in May 2002 and documented occurrence on Grapevine Mesa [EO 14]

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)
Julie M. Vanderwier

PHOTOGRAPHS (Check one or more)

Subject	Type
X Plant/Animal	X Slide
X Habitat	____ Print
X Diagnostic Feature	
____ Other	

May we obtain duplicates at our cost?
X Yes ____ No



Newhall Ranch

2002 San Fernando Valley spineflower - San Martinez Grande Canyon Area

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
Copy Sent To _____

PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU. USE THE BACK FOR COMMENTS IF NECESSARY. ***PLEASE ATTACH OR DRAW A MAP ON BACK.***

Scientific name (no codes): *Helianthus nuttallii* ssp. *parishii*

Reporter: Mark A. Elvin, Julie Vanderwier Phone: (760) 942.5147

Address: DUDEK & Associates, 605 Third Street, Encinitas, CA 92024

Date of Field Work: 29 Aug 2002 County: Los Angeles Collection: If yes, #25257 AC Sanders and MA Elvin Mus./Herb: UCR

Location: Northern Santa Susana Mountains, Newhall Ranch, southeast of confluence of the Santa Clara River and Castaic Creek, in a seep area south of the Santa Clara River between Middle Canyon and San Jose Flats on the edge of a slight rise in the middle of a one-acre spring/marsh complex ("Castaic Spring").

Quad Name: Newhall X 7½' __ 15' Elevation: 990-1010' T 4N R 17W E ¼ of E ¼ Sec3

Landowner/Manager: The Newhall Land and Farming Company, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? X Yes ____ No If not, reason:

Is this a new location record? X* Yes __ No ____ Unknown * see Comments below

Total # of Individuals = 15-20 plants Is this a subsequent visit? __ Yes X No Compared to your last visit: __ more __ same __ fewer

Phenology (plants): 5 % vegetative 90 % flowering 5 % fruiting

Population Age Structure (animals): ____ # adults ____ # juveniles ____ # others

Site Function for Species (animals): ____ breeding ____ foraging ____ wintering ____ roosting ____ denning ____ other

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

slight n aspect (1 to 5 degrees); soils dark-brown to black loamy on base of pebbly alluvial; in an opening of fresh water marsh surrounded by southern willow riparian woodland with *Urtica dioica, Salix lasiolepis, S. laevigata, Vitis girdiana, Mimulus guttatus, Berula erecta, Juncus balticus.*

Current Land Use/Visible Disturbances/Possible Threats: Current Land Use: Cattle grazing; Visible Disturbances: trampling (human); Possible Threats: over-collection, apparent continued expansion of the *Vitis girdiana*, proposed nearby residential/commercial development, potential changes in groundwater hydrology.

Overall Site Quality: ____ Excellent X Good ____ Fair ____ Poor

Comments: A specimen was collected independently by a representative of The Newhall Ranch Land and Farming Company and sent to the Herbarium at the University of California, Berkeley, where Dr. John Strother determined it to be consistent with *Helianthus nuttallii* ssp. *parishii* by (Barbara Errter, memo to Ken Koch; September 12, 2002). This specimen, along with others, were sent to Drs. Loren Rieseberg and Charles Heiser at the University of Indiana, Bloomington. They questioned the previous determination of *Helianthus nuttallii* ssp. *parishii*. Work is currently ongoing to verify the identity of this plant.

Should/Could this site be protected? How? This site and its hydrology should be protected.

Other comments:

DETERMINATION (Check one or more, fill in blanks)

X Keyed in a site reference: Hickman 1993, Heiser 1969
X Compared with specimen housed at: RSA
____ Compared with photo/drawing in:
X By another person (name): Andy Sanders, Steve Boyd, John Strother
____ Other:

PHOTOGRAPHS (Check one or more)

Subject	Type
X Plant/Animal	X Slide
X Habitat	____ Print
X Diagnostic Feature	
____ Other	

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone) Daryl Koutnik, Mary Meyer.

May we obtain duplicates **at our cost?** X Yes ____ No

Newhall Ranch
Los Angeles sunflower

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

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Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
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PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU. USE THE BACK FOR COMMENTS IF NECESSARY. ***PLEASE ATTACH OR DRAW A MAP ON BACK.***

Scientific name (no codes): *Opuntia basilaris* var. *brachyclada*

Reporter: Mark Elvin & Julie Vanderwier Phone: (760) 942-5147

Address: DUDEK & Associates, 605 Third Street, Encinitas, CA 92024

Date of Field Work: June-July 2002 County: Los Angeles Collection: yes If yes, # Mus./Herb:

Location: Northern Santa Susana Mountains, Newhall Ranch, southeast of confluence of the Santa Clara River and Castaic Creek, east, south, and west edges of Airport Mesa and adjacent mesas.

Quad Name: Newhall
X 7½' __ 15' Elevation: 1000-1300' T 4N R 16W W ¼ of W ¼ Sec3
T 4N R 17W E ¼ of E ¼ Sec3

Landowner/Manager: The Newhall Land and Farming Company, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? X Yes ____ No If not, reason:

Is this a new location record? X Yes ____ No ____ Unknown

Total # of Individuals = 200-1,000 Is this a subsequent visit? __ Yes X No Compared to your last visit: __ more __ same __ fewer

Phenology (plants): 90 % vegetative 5 % flowering* 5 % fruiting

Population Age Structure (animals): ____ # adults ____ # juveniles ____ # others

Site Function for Species (animals): ____ breeding ____ foraging ____ wintering ____ roosting ____ denning ____ other

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

Venturan coastal sage scrub with *Artemisia californica, Eriogonum fasciculatum, E. elongatum, E. gracile, Salvia leucophylla, Ericameria palmeri* var. *pachypus, Mirabilis californica*

Current Land Use/Visible Disturbances/Possible Threats: Current Land Use: Cattle grazing, farming; Visible Disturbances: cattle grazing, farming, grading/clearing; Possible Threats: proposed residential/commercial development.

Overall Site Quality: ____ Excellent X Good ____ Fair ____ Poor

Comments: Plants were sparsely distributed with the polygons.

Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

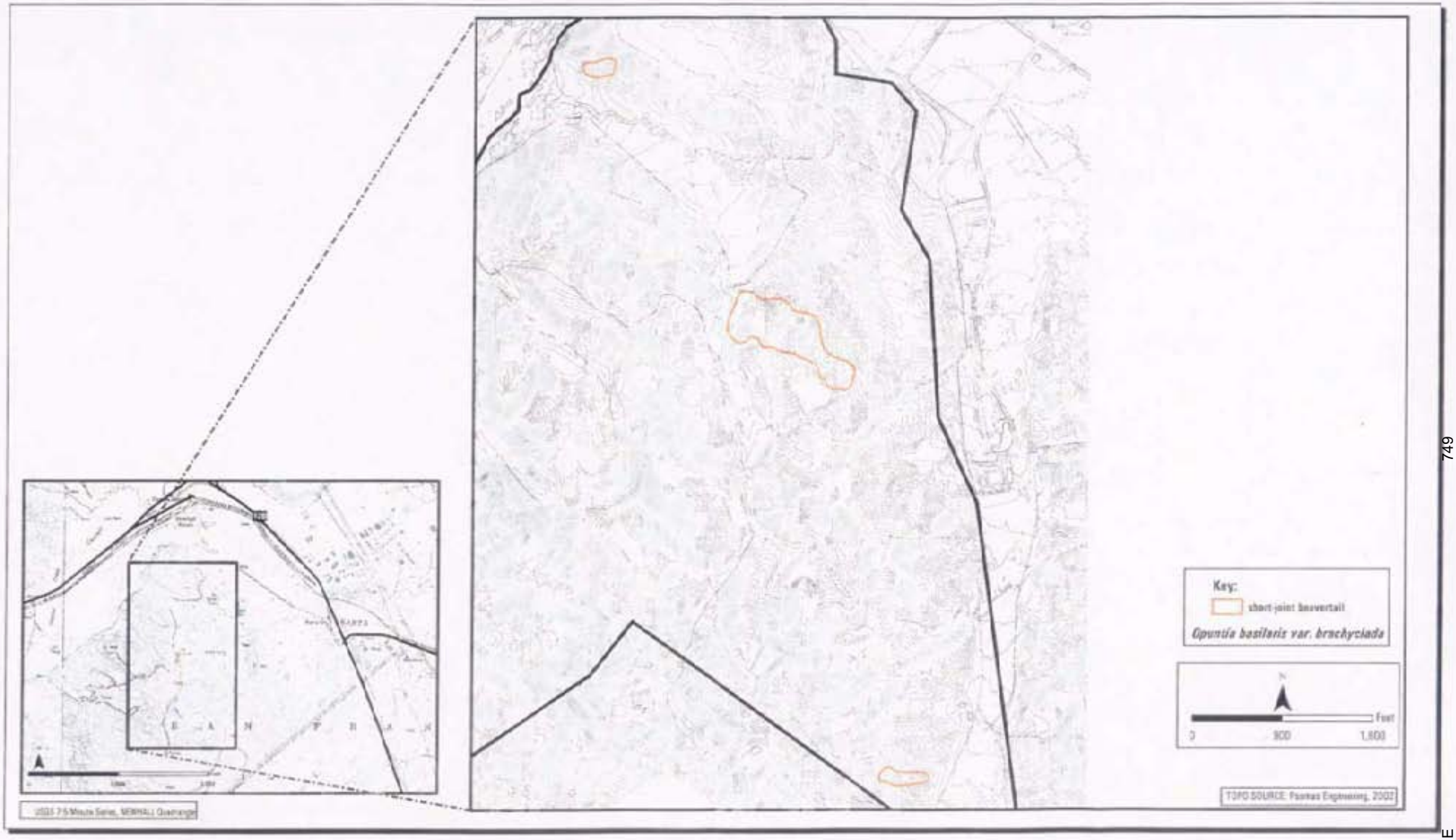
X Keyed in a site reference: Hickman 1993
X Compared with specimen housed at: RSA
____ Compared with photo/drawing in:
____ By another person (name):
____ Other:

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone) Kim Marsden

PHOTOGRAPHS (Check one or more)

Subject	Type
X Plant/Animal	X Slide
X Habitat	____ Print
X Diagnostic Feature	
____ Other	

May we obtain duplicates at our cost?
X Yes ____ No



Newhall Ranch

2002 short-joint beavertail - Airport Mesa Area

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

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Index Code _____ Occurrence # _____
Copy Sent To _____

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Scientific name (no codes): *Opuntia basilaris* var. *brachyclada*

Reporter: Mark Elvin & Julie Vanderwier Phone: (760) 942-5147

Address: DUDEK & Associates, 605 Third Street, Encinitas, CA 92024

Date of Field Work: June-July 2002 County: Los Angeles Collection: yes If yes, # Mus./Herb:

Location: Northern Santa Susana Mountains, Newhall Ranch, south of confluence of the Santa Clara River and Castaic Creek, the vicinity of Grapevine Mesa.

Quad Name: Val Verde
_X_ 7½' __ 15' Elevation: 1000-1300' T 17W R 4N _____ ¼ o _____ ¼ Sec_____

Landowner/Manager: The Newhall Land and Farming Company, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? _X_ Yes ____ No If not, reason:

Is this a new location record? _X_ Yes ____ No ____ Unknown

Total # of Individuals = 200-1,000 Is this a subsequent visit? __ Yes _X_ No Compared to your last visit: __ more __ same __ fewer

Phenology (plants): 90 % vegetative 5 % flowering* 5 % fruiting

Population Age Structure (animals): ____ # adults ____ # juveniles ____ # others

Site Function for Species (animals): ____ breeding ____ foraging ____ wintering ____ roosting ____ denning ____ other

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

Venturan coastal sage scrub with *Artemisia californica, Eriogonum fasciculatum, E. elongatum, E. gracile, Salvia leucophylla, Ericameria palmeri* var. *pachypus, Mirabilis californica*

Current Land Use/Visible Disturbances/Possible Threats: Current Land Use: Cattle grazing, farming; Visible Disturbances: cattle grazing, farming; Possible Threats: proposed residential/commercial development.

Overall Site Quality: ____ Excellent _X_ Good ____ Fair ____ Poor

Comments: Plants were sparsely distributed with the polygons.

Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

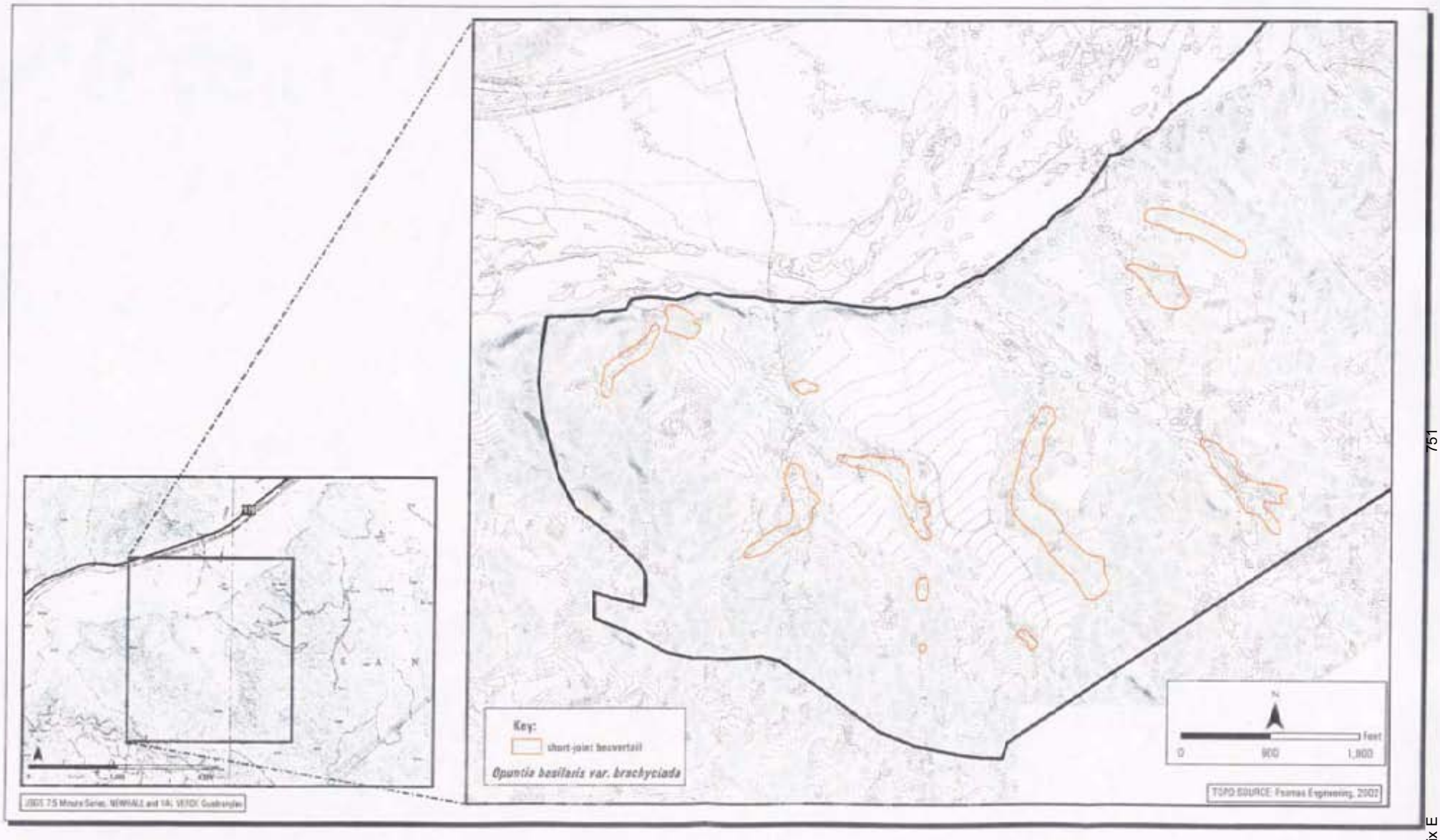
_X_ Keyed in a site reference: Hickman 1993
_X_ Compared with specimen housed at: RSA
____ Compared with photo/drawing in:
____ By another person (name):
____ Other:

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone) Kim Marsden

PHOTOGRAPHS (Check one or more)

Subject	Type
_X_ Plant/Animal	_X_ Slide
_X_ Habitat	____ Print
_X_ Diagnostic Feature	
____ Other	

May we obtain duplicates at our cost?
_X_ Yes ____ No



Newhall Ranch

2002 short-joint beavertail - Grapevine Mesa Area

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

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Index Code _____ Occurrence # _____
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Scientific name (no codes): *Opuntia basilaris* var. *brachyclada*

Reporter: Mark Elvin & Julie Vanderwier Phone: (760) 942-5147

Address: DUDEK & Associates, 605 Third Street, Encinitas, CA 92024

Date of Field Work: June-July 2002 County: Los Angeles Collection: yes If yes, # Mus./Herb:

Location: Northern Santa Susana Mountains, Newhall Ranch, southwest of confluence of the Santa Clara River and Castaic Creek, scattered in Long Canyon.

Quad Name: Val Verde
_X_ 7½' __ 15' Elevation: 1000-1300' T 4N R 17W ___ ¼ of ___ ¼ Sec 3

Landowner/Manager: The Newhall Land and Farming Company, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? _X_ Yes ___ No If not, reason:

Is this a new location record? _X_ Yes ___ No ___ Unknown

Total # of Individuals = 250-1250 Is this a subsequent visit? __ Yes _X_ No Compared to your last visit: __ more __ same __ fewer

Phenology (plants): 90 % vegetative ~5 % flowering* ~5 % fruiting

Population Age Structure (animals): ___ # adults ___ # juveniles ___ # others

Site Function for Species (animals): ___ breeding ___ foraging ___ wintering ___ roosting ___ denning ___ other

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

Venturan coastal sage scrub with *Artemisia californica, Eriogonum fasciculatum, E. elongatum, E. gracile, Salvia leucophylla, Ericameria palmeri* var. *pachypus, Mirabilis californica*

Current Land Use/Visible Disturbances/Possible Threats: Current Land Use: Cattle grazing, farming; Visible Disturbances: cattle grazing, oil well operations; Possible Threats: proposed residential/commercial development.

Overall Site Quality: ___ Excellent _X_ Good ___ Fair ___ Poor

Comments: Plants were sparsely distributed with the polygons.

Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

_X_ Keyed in a site reference: Hickman 1993
_X_ Compared with specimen housed at: RSA
___ Compared with photo/drawing in:
___ By another person (name):
___ Other:

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject	Type
_X_ Plant/Animal	_X_ Slide
_X_ Habitat	___ Print
_X_ Diagnostic Feature	
___ Other	

May we obtain duplicates **at our cost?**
_X_ Yes ___ No

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
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Scientific name (no codes): *Opuntia basilaris* var. *brachyclada*

Reporter: Mark Elvin & Julie Vanderwier Phone: (760) 942-5147

Address: DUDEK & Associates, 605 Third Street, Encinitas, CA 92024

Date of Field Work: June-July 2002 County: Los Angeles Collection: yes If yes, # Mus./Herb:

Location: Northern Santa Susana Mountains, Newhall Ranch, northwest of confluence of the Santa Clara River and Castaic Creek, scattered in Chiquito Canyon.

Quad Name: Val Verde
_X_ 7½' __ 15' Elevation: 1000-1300' T _4N_ R _17W_ ___ ¼ of___¼ Sec 15 and 16

Landowner/Manager: The Newhall Land and Farming Company, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? _X_ Yes ____ No If not, reason:

Is this a new location record? _X_ Yes ____ No ____ Unknown

Total # of Individuals = 100-750 Is this a subsequent visit? __ Yes _X_ No Compared to your last visit:__ more __ same __ fewer

Phenology (plants): _90_ % vegetative _~5_ % flowering* _~5_ % fruiting

Population Age Structure (animals): ____ # adults ____ # juveniles ____ # others

Site Function for Species (animals): ____ breeding ____ foraging ____ wintering ____ roosting ____ denning ____ other

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

Venturan coastal sage scrub with *Artemisia californica, Eriogonum fasciculatum, E. elongatum, E. gracile, Salvia leucophylla, Ericameria palmeri* var. *pachypus, Mirabilis californica*

Current Land Use/Visible Disturbances/Possible Threats: Current Land Use: Cattle grazing, farming; Visible Disturbances: cattle grazing; Possible Threats: proposed residential/commercial development.

Overall Site Quality: ____ Excellent _X_ Good ____ Fair ____ Poor

Comments: Plants were sparsely distributed with the polygons.

Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

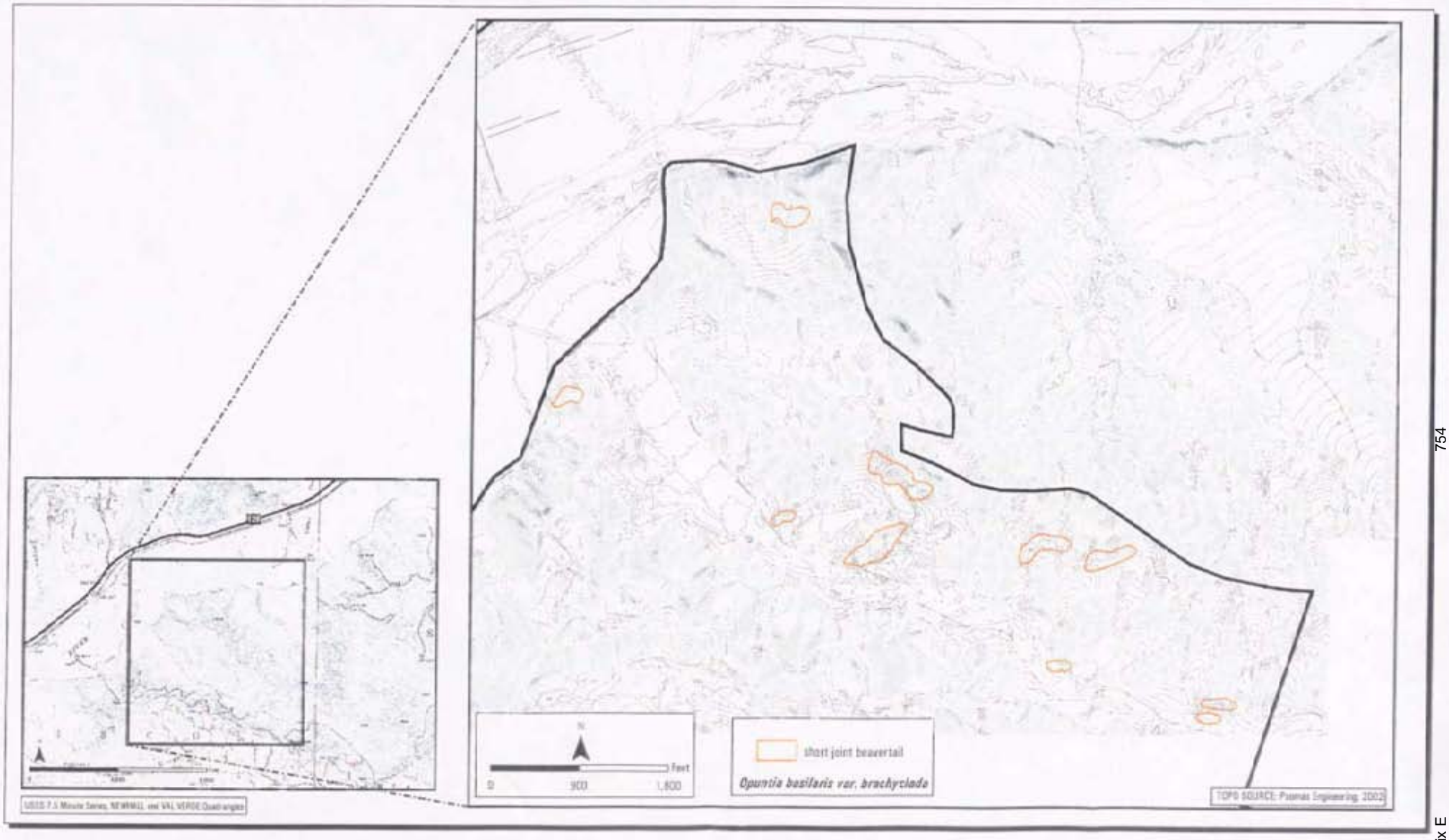
_X_ Keyed in a site reference: Hickman 1993
_X_ Compared with specimen housed at: RSA
____ Compared with photo/drawing in:
____ By another person (name):
____ Other:

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject	Type
_X_ Plant/Animal	_X_ Slide
_X_ Habitat	____ Print
_X_ Diagnostic Feature	
____ Other	

May we obtain duplicates **at our cost?**
_X_ Yes ____ No



Newhall Ranch

2002 short-joint beavertail · Long Canyon Area

FLx, Plant Surveys

Sensitive Plant Species Surveys

RARE PLANT SURVEYS

NEWHALL RANCH SPECIFIC PLAN PROJECT SITES
LOS ANGELES COUNTY, CA

Submitted to:

IMPACT SCIENCES, INC.
30343 Canwood Street, Suite 210
Agoura Hills, CA 91301
ATTN: Tom Worthington

Submitted by:

Anuja Parikh, Ph.D., PWS
Nathan Gale, Ph.D., PWS
FL*x*
1215 Bajada
Santa Barbara, CA 93109
Tel/FAX: 805-564-1352

September 2002

1. INTRODUCTION

This report documents the results of rare plant surveys conducted within the Newhall Ranch Specific Plan area in Los Angeles County, California. The four project locations surveyed were River Village, Homestead, Salt Canyon, and a portion of Airport Mesa. The River Village site is located along the Santa Clara River from the Los Angeles County line in the west to Castaic Creek in the east. It also extends northward into part of Chiquito Canyon and southward into part of Long Canyon; it was surveyed during the period of May 5 through May 21, 2001. The Homestead site comprises the plan area north of Highway 126 and north of River Village, and includes the sites designated as Homestead, Homestead Estates, and Chiquito Canyon Residential; it was surveyed from May 22 through May 30, 2001. Salt Canyon lies south of the Santa Clara River along the extreme western boundary of the plan area, east of the county line; it was surveyed from June 15 through June 17, 2001. The portion of Airport Mesa that was surveyed lies in the northeastern part of the plan area; it was surveyed from May 1 through May 5, 2002. See Figures 1 and 2 for the specific survey locations and for a key to the other figures presented in this report.

A team of two consultants from FL*x* (Dr. Anuja Parikh and Dr. Nathan Gale) conducted the rare plant surveys with specific focus on target species potentially occurring at the site, including the San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*). In addition, vegetation types and plant species associations were noted and their dominant species recorded. A list of observed plant species, including rare and commonly occurring plants, was compiled. Plant community descriptions in this report follow Holland (1986) where applicable; species nomenclature follows Hickman (1993).

2. VEGETATION TYPES AND PLANT SPECIES ASSOCIATIONS

The Newhall Ranch Specific Plan area is composed of variable terrain, ranging from relatively flat riverwash, secondary washes, and terraces, to previously disturbed flat areas or fields, to gentle and steep hillslopes and ridges.

Developed and/or Disturbed Areas. Portions of each of the four sites surveyed in the Specific Plan area, particularly the valley flatlands and the tops of mesas, comprise areas that have been disturbed previously by agricultural disking or grading, or currently are agricultural fields. There are small areas of buildings associated with agricultural operations, and additionally, there are roads and pads associated with previous and ongoing oil field development. The disturbed areas not under active use have ruderal vegetation dominated by non-native plants. Species observed included bromegrasses (*Bromus* spp.), oats (*Avena* spp.), hare barley (*Hordeum murinum*), shortpod mustard (*Hirschfeldia incana*), and red-stemmed filaree (*Erodium cicutarium*).

NEWHALL RANCH
Newhall Ranch Company

L E G E N D

FLX Survey Extent

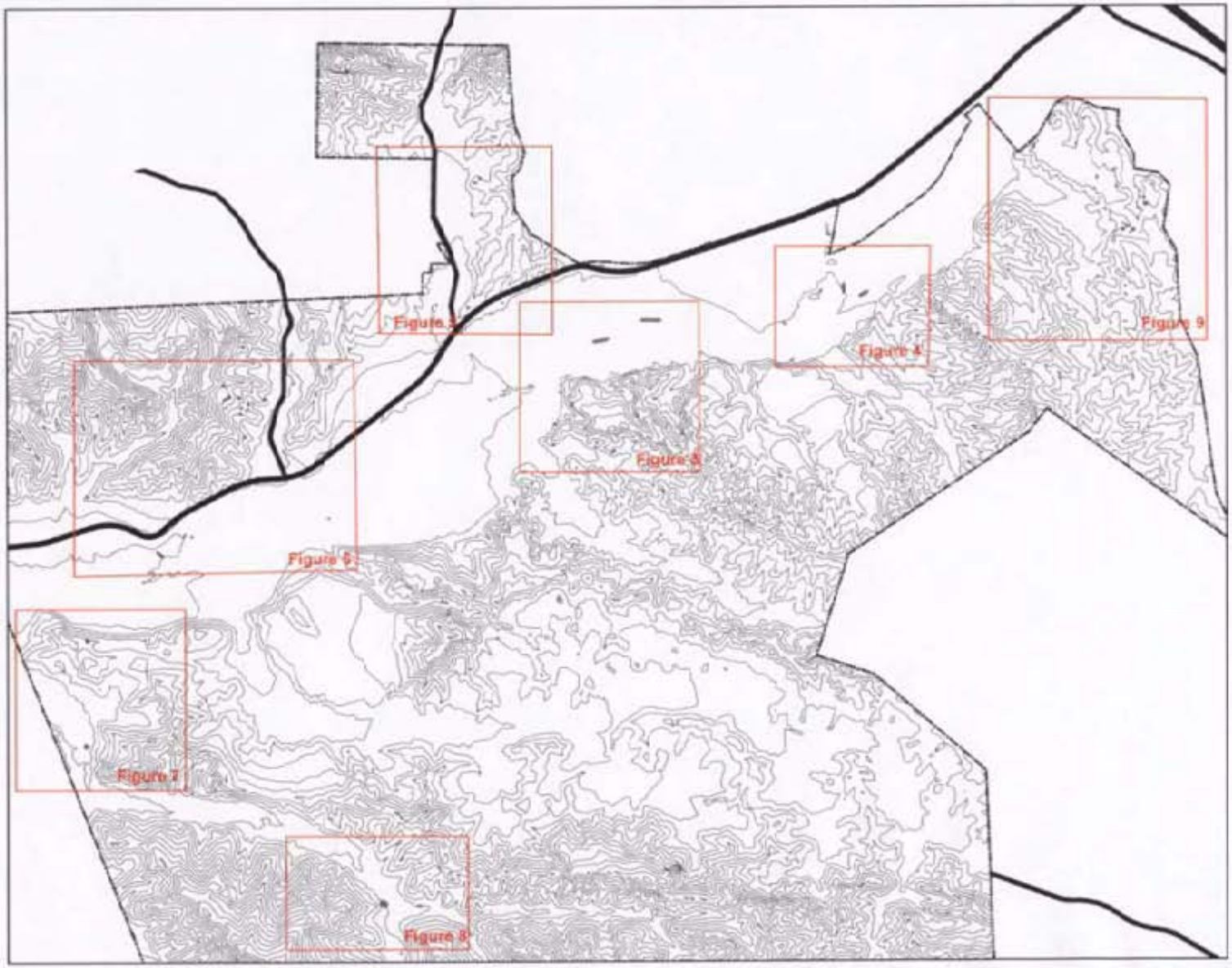
Newhall Ranch Specific Plan Boundary

Feet 0 1,250 2,500

Meters 0 400 800

FORMA

Figure 1
FLX SURVEY EXTENTS



NEWHALL RANCH

L E G E N D

Rare Plant Locations

FORMA

NORTH

Figure 2

RARE PLANT GRAPHIC INDEX

Non-Native Grassland. This community occurs on relatively flat terrain and sometimes on gentle hillslopes throughout the Specific Plan area. Annual introduced grasses up to about 0.5 m tall are dominant in non-native grasslands; annual herb species also are found. Flowering occurs in spring, and the plants mostly are dead in summer and fall. Non-native grasslands occur on fine-textured, usually clay soils, that are moist to wet in the winter but dry in the summer and fall (Holland, 1986). Grass species found at the sites include mainly bromegrasses (*Bromus diandrus*, *B. madritensis* ssp. *rubens*, *B. hordeaceus*), wild oats (*Avena barbata*, *A. fatua*), and rat-tail fescue (*Vulpia myuros* ssp. *myuros*). Introduced herbaceous ruderal species also are found, and include red-stemmed filaree (*Erodium cicutarium*), shortpod mustard (*Hirschfeldia incana*), and star-thistles (*Centaurea* spp.). Scattered native plants found in this community include small-seed sandmat (*Chamaesyce polycarpa*), wishbone bush (*Mirabilis californica*), and clarkias (*Clarkia* spp.). With respect to sensitivity status, non-native grassland has been state-ranked as S4 (apparently secure) by the California Natural Diversity Database (CNDDB).

Venturan Coastal Sage Scrub. Coastal sage scrub is the most extensive vegetation type within the Specific Plan area, and occurs on gentle to steep hillslopes in all surveyed sites. It varies in cover from dense to sparse. This community contains low, soft-woody shrubs up to 1.5 m tall, and is not as dense as chaparral or some other coastal scrubs. Plant growth occurs in late winter and spring after the rains, with most species flowering in spring and summer (Holland, 1986). Dominant native species in the scrub found on the four sites are California buckwheat (*Eriogonum fasciculatum* var. *foliolosum*) and California sagebrush (*Artemisia californica*); other common plants include sages (*Salvia leucophylla*, *S. mellifera*, *S. apiana*), California broom (*Lotus scoparius*), California-aster (*Lessingia filaginifolia* var. *filaginifolia*), California encelia (*Encelia californica*), giant wild-rye (*Leymus condensatus*), and chaparral mallow (*Malacothamnus fasciculatus*). Elements of the more xeric Riversidian sage scrub also are scattered in the scrub, and include thickleaf yerba santa (*Eriodictyon crassifolium* var. *nigrescens*), goldenbush (*Ericameria palmeri* var. *pachylepis*), Our Lord's candle (*Yucca whipplei*), and cactus (*Opuntia basilaris* var. *basilaris*, *O. littoralis*). The understory generally is sparse, with grasses, including the native foothill needlegrass (*Nassella lepida*), and native herbs such as wishbone bush (*Mirabilis californica*) and morning-glory (*Calystegia macrostegia*). Scrub with generally sparser shrub cover provides habitat for the sensitive species, Peirson's morning-glory (*Calystegia peirsonii*) and San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*). With respect to sensitivity status, Venturan coastal sage scrub has been state-ranked as S3.1 (10,000 to 50,000 acres, very threatened) by the CNDDB.

Coastal Sage - Chaparral Scrub. The steepest north-facing slopes in Long Canyon and the northern part of Chiquito Canyon support a mixed association of coastal sage scrub and chaparral species. Chaparral is made up of sclerophyllous evergreen shrubs adapted to fire, and is dense in cover, often impenetrable, with a sparse understory (Holland, 1986). It is dominated by shrubs about 1 to 3 m tall. Growth is highest in the spring and reduced in the summer, and flowering occurs late winter to early summer. Species found in the coastal sage-chaparral scrub include chamise (*Adenostoma fasciculatum*), hoaryleaf ceanothus (*Ceanothus crassifolius*), black sage (*Salvia mellifera*), toyon (*Heteromeles arbutifolia*), California buckwheat (*Eriogonum fasciculatum* var. *foliolosum*), California encelia (*Encelia californica*), bush monkeyflower (*Mimulus aurantiacus*), mountain mahogany (*Cercocarpus betuloides* var. *betuloides*), blue elderberry (*Sambucus mexicana*), and heart-leaved penstemon (*Keckiella*

cordifolia). With respect to sensitivity status, coastal sage-chaparral scrub has been state-ranked as S3.2 (10,000 to 50,000 acres, threatened) by the CNDDB.

Coast Live Oak Woodland. This community occurs at the base of protected north-facing slopes in Long Canyon and the northern part of Chiquito Canyon, and is dominated by the evergreen coast live oak (*Quercus agrifolia* var. *agrifolia*). Trees can reach 10 to 25 m in height and are known to be long-lived and well adapted to surviving fire. Oak woodlands occur away from the direct influence of the ocean in shaded canyons and on north-facing slopes (Holland, 1986). They often grade into chaparral or coastal scrub upslope or under drier conditions; on moister sites or areas subject to fog, they grade into various forest types. The shrub layer is poorly developed in oak woodlands, and the herb layer often has annual grasses, which have replaced the native perennial grasses once commonly associated with this community. Species associates are spiny redberry (*Rhamnus crocea*), skunkbrush (*Rhus trilobata*), blue elderberry (*Sambucus mexicana*), holly-leaf cherry (*Prunus ilicifolia* ssp. *ilicifolia*), wild cucumber (*Marah macrocarpus* var. *macrocarpus*), eucrypta (*Eucrypta chrysanthemifolia*), clarkias (*Clarkia* spp.), bedstraws (*Galium* spp.), and ripgut grass (*Bromus diandrus*). With respect to sensitivity status, coast live oak woodland has been state-ranked as S4 (apparently secure) by the CNDDB.

Valley Oak Woodland. Small patches of woodland dominated by the winter-deciduous valley oak (*Quercus lobata*) occur in the northeastern part of the surveyed portion of Airport Mesa. Valley oaks (*Quercus lobata*) are California's largest broad-leaved tree, and grow in an open canopy form, reaching 15 to 35 m in height. They typically occur on deep, well-drained alluvial soils in valleys, but also on non-alluvial soils on slopes. Understory plants observed at the site include California-aster (*Lessingia filaginifolia* var. *filaginifolia*), California sagebrush (*Artemisia californica*), foxtail chess (*Bromus madritensis* ssp. *rubens*), goldenbush (*Ericameria palmeri* var. *pachylepis*), and ripgut grass (*Bromus diandrus*). With respect to sensitivity status, valley oak woodland has been state-ranked as S2.1 (2,000 to 10,000 acres, very threatened) by the CNDDB.

Riverwash. In the Newhall Ranch Specific Plan area, the main channel of the Santa Clara River and tributary washes are sparsely vegetated and subject to scouring. The soils are sandy riverwash and gravel, and in places form sand bars and low terraces within the channels. No well-defined plant community is found here, although scattered elements of riparian scrub were observed. Shrub species found in and adjacent to the dry channels include mule fat (*Baccharis salicifolia*), sandbar willow (*Salix exigua*), tamarisk (*Tamarix* sp.), scale-broom (*Lepidospartum squamatum*), big saltbush (*Atriplex lentiformis* ssp. *lentiformis*), California broom (*Lotus scoparius*), and Great Basin sagebrush (*Artemisia tridentata*). Smaller plants growing in these areas include woolly star (*Eriastrum densifolium* ssp. *elongatum*), hairy goldenaster (*Heterotheca sessiliflora* ssp. *fastigiata*), buckwheat (*Eriogonum baileyi*), Mediterranean schismus (*Schismus barbatus*), cryptantha (*Cryptantha micrantha*), slender pectocarya (*Pectocarya linearis* ssp. *ferocula*), lastarriaea (*Lastarriaea coriacea*), California evening primrose (*Oenothera californica* ssp. *californica*), annual bur-sage (*Ambrosia acanthicarpa*), and foxtail chess (*Bromus madritensis* ssp. *rubens*).

Freshwater Marsh. Small patches of wet areas in the main channel of the Santa Clara River and tributary washes in the Newhall Ranch Specific Plan area have freshwater marsh vegetation. This community typically is dominated by emergent perennial monocots, often up to 5 m tall and forming closed canopies. Marshes are found on relatively deep organic soils on sites permanently flooded with

fresh water (Holland, 1986). Species found in the wettest parts of the channels are cattails (*Typha angustifolia, T. latifolia*), bulrushes (*Scirpus californicus, S. americanus*), nutsedge (*Cyperus esculentus*), water cress (*Rorippa nasturtium-aquaticum*), water speedwell (*Veronica anagallis-aquatica*), and hoary nettle (*Urtica dioica* ssp. *holosericea*). With respect to sensitivity status, freshwater marsh has been state-ranked as S2.1 (2,000 to 10,000 acres, very threatened) by the CNDDB.

Mule Fat Scrub. Mule fat scrub is found in linear patches along the main channel of the Santa Clara River and some tributary drainages in the Newhall Ranch Specific Plan area. Mule fat scrub typically is a tall, semi-woody and herbaceous riparian scrub, and is relatively species-poor. An early seral community, it often grades to riparian woodland or forest (Holland, 1986). The dominant species in this community is mule fat (*Baccharis salicifolia*); arrow weed (*Pluchea sericea*), tree tobacco (*Nicotiana glauca*), and tamarisk (*Tamarix* sp.) also are common. The understory is sparse or absent, but sometimes includes species such as Mexican rush (*Juncus mexicanus*) and grasses. With respect to sensitivity status, mule fat scrub has been state-ranked as S4 (apparently secure) by the CNDDB.

Southern Willow Scrub. Several small patches of this community occur along the main channel of the Santa Clara River and in the northern part of Chiquito Canyon. Willow scrub is a broadleaved, winter-deciduous riparian community, typically too dense to allow understory development. It is a relatively early seral community, succeeding to cottonwood-sycamore forests (Holland, 1996). In the Specific Plan area, this community includes willows (*Salix exigua, S. lasiolepis, S. laevigata*), mule fat (*Baccharis salicifolia*), and Mexican elderberry (*Sambucus mexicana*). The understory is sparse, with species such as mugwort (*Artemisia douglasiana*), shrubby phacelia (*Phacelia ramosissima* var. *ramosissima*), and grasses. With respect to sensitivity status, southern willow scrub has been state-ranked as S2.1 (2,000 to 10,000 acres, very threatened) by the CNDDB.

Southern Cottonwood-Willow Riparian Forest. This community occurs on terraces above the main channel of the Santa Clara River. It consists of tall, open, broadleaved, winter-deciduous trees, and is dominated by Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) and willows (*Salix lasiolepis, S. laevigata, S. exigua*). These species require moist, bare mineral soil for germination and establishment, provided after floodwaters recede; this forest type therefore is found mostly along perennially wet streams (Holland, 1996). Scattered coast live oak (*Quercus agrifolia* var. *agrifolia*) trees sometimes occur in this forest type on the upper parts of the river terraces in the Specific Plan area. Understory plants include mule fat (*Baccharis salicifolia*), arrow weed (*Pluchea sericea*), Mexican elderberry (*Sambucus mexicana*), southern California black walnut (*Juglans californica* var. *californica*), mugwort (*Artemisia douglasiana*), hoary nettle (*Urtica dioica* ssp. *holosericea*), ripgut grass (*Bromus diandrus*), and alkali rye (*Leymus triticoides*). With respect to sensitivity status, southern cottonwood-willow riparian forest has been state-ranked as S3.2 (10,000 to 50,000 acres, threatened) by the CNDDB.

3. RARE PLANT SPECIES

The rare plant surveys of River Village, Homestead, and Salt Canyon were carried out in the months of May and June 2001 to accommodate the blooming periods of various species potentially occurring in the region, or previously reported by the CNDDB. In 2002, the surveys of portions of Airport Mesa were conducted in early May due to the very low rainfall year in southern California that resulted in

annual plants having a particularly short-lived season. A list of target species potentially occurring at the four sites is presented in Table 1; these species were searched for during the focused rare plant surveys.

TABLE 1: SENSITIVE PLANT SPECIES POTENTIALLY OCCURRING ON THE NEWHALL RANCH SPECIFIC PLAN PROJECT SITES

Scientific Name	Common Name	Family	Status* Federal/State/CNPS
Astragalus brauntonii	Braunton's milk-vetch	Fabaceae	FE/-/1B
Berberis nevinii	Nevin's barberry	Berberidaceae	FE/SE/1B
Calochortus clavatus var. *gracilis*	Slender mariposa lily	Liliaceae	FSC/-/1B
Calochortus plummerae	Plummer's mariposa lily	Liliaceae	FSC/-/1B
Calystegia peirsonii	Peirson's morning-glory	Convolvulaceae	FSC/-/4
Cercocarpus betuloides var. *blancheae*	Island mountain-mahogany	Rosaceae	-/-/4
Chorizanthe parryi var. *Fernandina*	San Fernando Valley spineflower	Polygonaceae	FC/SE/1B
Deinandra minthornii	Santa Susana tarplant	Asteraceae	FSC/SR/1B
Delphinium parryi ssp. *Blochmaniae*	Dune larkspur	Ranunculaceae	FSC/-/1B
Dodecahema leptoceras	Slender-horned spineflower	Polygonaceae	FE/SE/1B
Dudleya blochmaniae ssp. *blochmaniae*	Blochman's dudleya	Crassulaceae	FSC/-/1B
Dudleya multicaulis	Many-stemmed dudleya	Crassulaceae	FSC/-/1B
Harpagonella palmeri var. *palmeri*	Palmer's grappling hook	Boraginaceae	FSC/-/4
Juglans californica var. *californica*	Southern California black walnut	Juglandaceae	-/-/4
Juncus acutus ssp. *Leopoldii*	Southwestern spiny rush	Juncaceae	-/-/4
Opuntia basilaris var. *brachyclada*	Short-joint beavertail	Cactaceae	FSC/-/1B
Perideridia pringlei	Pringle's yampah	Apiaceae	-/-/4
Senecio aphanactis	Rayless ragwort	Asteraceae	-/-/2

* FE = Federal endangered
FC = Federal candidate
FSC = Federal species of concern (unofficial designation)
SE = State/California endangered
SR = State/California rare
1B = CNPS List 1B, rare or endangered in California and elsewhere
2 = CNPS List 2, rare or endangered in California, more common elsewhere
4 = CNPS List 4, plants of limited distribution

A known population (not on Newhall Ranch) of the slender-horned spineflower (*Dodecahema leptoceras*) and a known population (on Newhall Ranch) of San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) were field-checked as reference populations in 2001 and 2002. Both species were observed flowering in 2001. Despite the low rainfall in 2002, San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) had germinated and was observed flowering, but no plants of slender-horned spineflower (*Dodecahema leptoceras*) were seen.

At all the project sites, when sensitive plants were observed, their locations were mapped and population sizes were estimated. Single plants of a species or small populations were marked on the map with a point; larger populations were indicated with a polygon representing the spatial extent of the plants. The determination of which individual plants were included in a given polygon was based on their

distribution or spatial clustering. Each population composed of more than one plant represents a cluster of plants. Clusters were mapped either separately or combined into larger clusters based on applied field judgment regarding the degree of continuity of species cover as well as the scale of the maps used in the field. For example, at the scale of a USGS 7.5 minute quadrangle, the smallest area that can be mapped with a polygon is about 1 acre; on maps at scales of 1 inch=200 feet, or 1 inch=400 feet, such as those used in the field for the project sites, much smaller areas can be mapped.

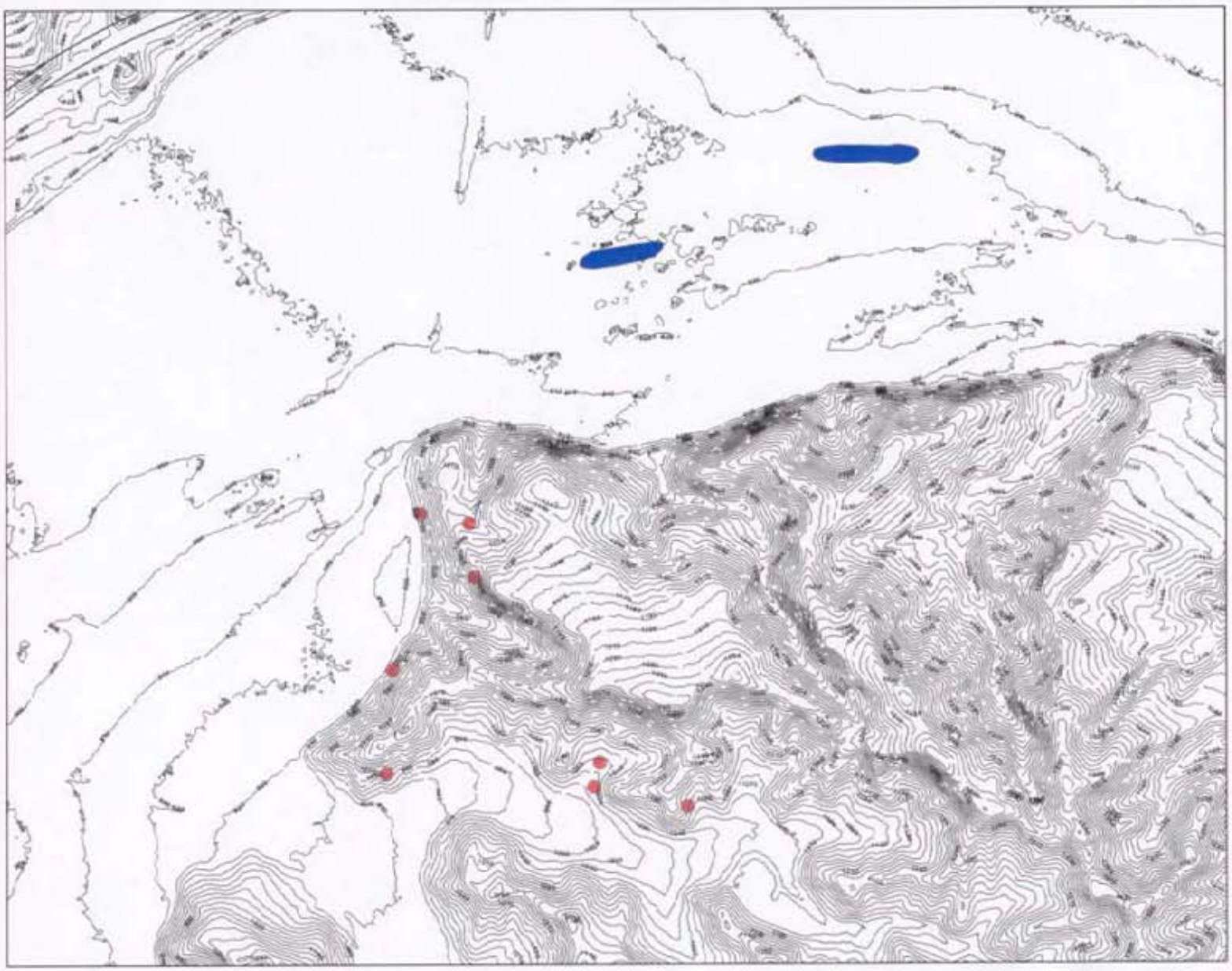
The population size, when small, was based on counting individual plants. For larger populations, plants were counted in a small representative area, and then an estimate for the entire population was made based on visual extrapolation over the larger area.

3.1 River Village

Three sensitive species were found in the River Village project site during the 2001 surveys: Peirson's morning-glory (*Calystegia peirsonii*), southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*), and southern California black walnut (*Juglans californica* var. *californica*), all CNPS List 4 species. A summary of the populations of these species located at the site is provided below. These population locations, as numbered below, have been marked on the accompanying maps (See Figures 3, ~~and~~ 4, 5 and 6).

Peirson's morning-glory (*Calystegia peirsonii*) populations were found in 10 locations on slopes with different exposures. Elevations ranged from 1000 to 1200 feet, and the soils were variable in texture (see Figures 3, 5, and 6). Most plants were flowering, and were associated with grassland and coastal sage scrub species.

1. ~75 plants, with *Eriogonum fasciculatum*, *Avena fatua*, and *Bromus diandrus*.
2. ~1000 plants, with *Eriogonum fasciculatum* and *Bromus diandrus*.
3. ~30 plants, with *Bromus* spp. and *Lupinus* spp.
4. ~10 plants, with *Eriogonum fasciculatum* and *Bromus* spp.
5. ~25 plants, with *Artemisia californica*, *Bromus diandrus*, and *Bromus madritensis* ssp. *rubens*.
6. ~75 plants, with *Artemisia californica*, *Eriogonum fasciculatum*, and *Melica imperfecta*.
7. ~20 plants, with *Bromus madritensis* ssp. *rubens*.
8. ~10 plants, with *Bromus hordeaceus*, *Centaurea melitensis*, and *Chaenactis glabriuscula*.
9. ~150 plants, with *Eriogonum fasciculatum*, *Lessingia filaginifolia*, and *Bromus madritensis* ssp. *rubens*.
10. ~75 plants, with *Bromus madritensis* ssp. *rubens* and *Centaurea melitensis*.



NEWHALL RANCH

L E G E N D

Southern California Black Walnut

Peirson's Morning-Glory

Meters 0 65 130

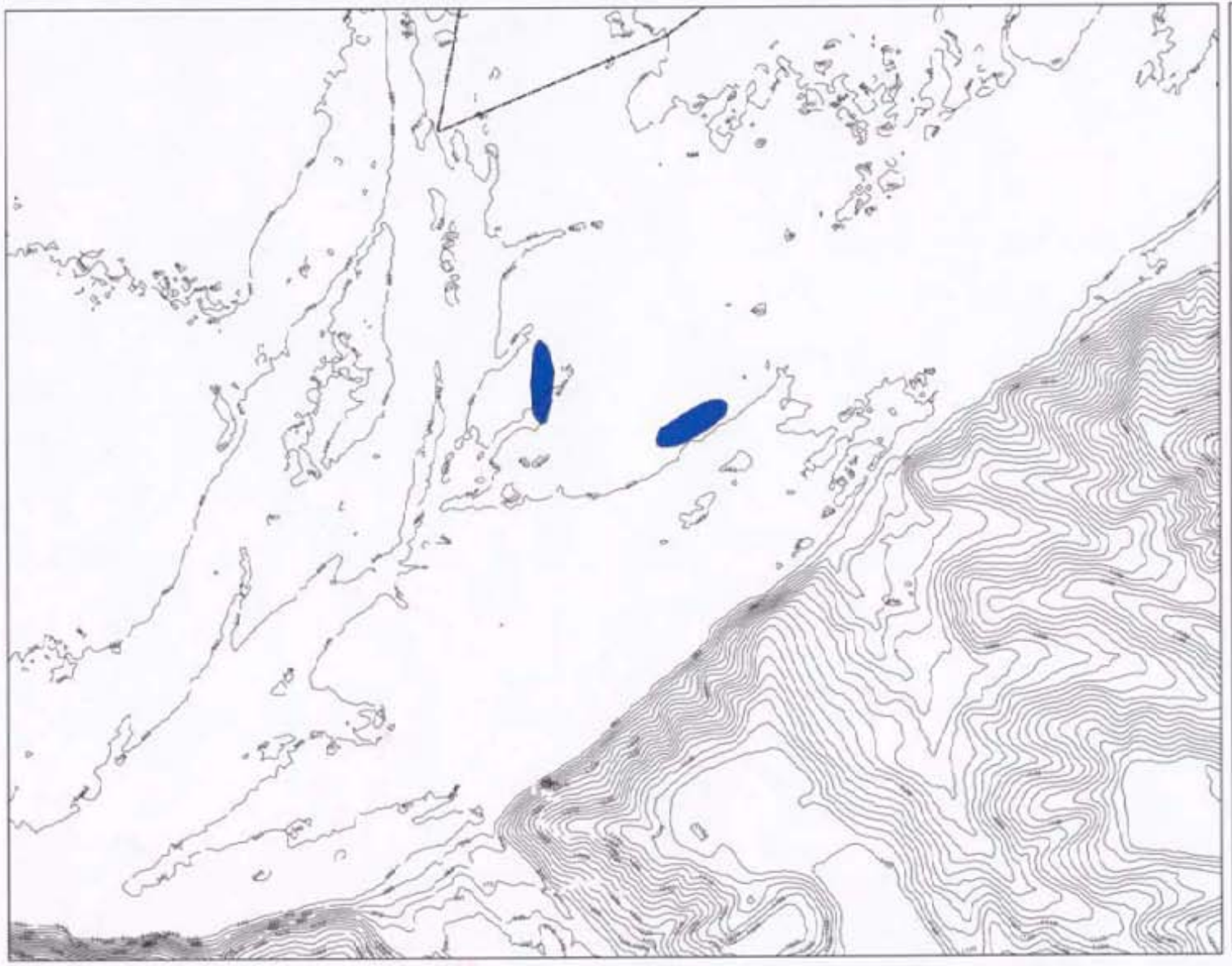
Feet 0 225 450

FORMA

November 2002

Figure 3

RARE PLANT LOCATIONS



NEWHALL RANCH

L E G E N D

Southern California Black Walnut

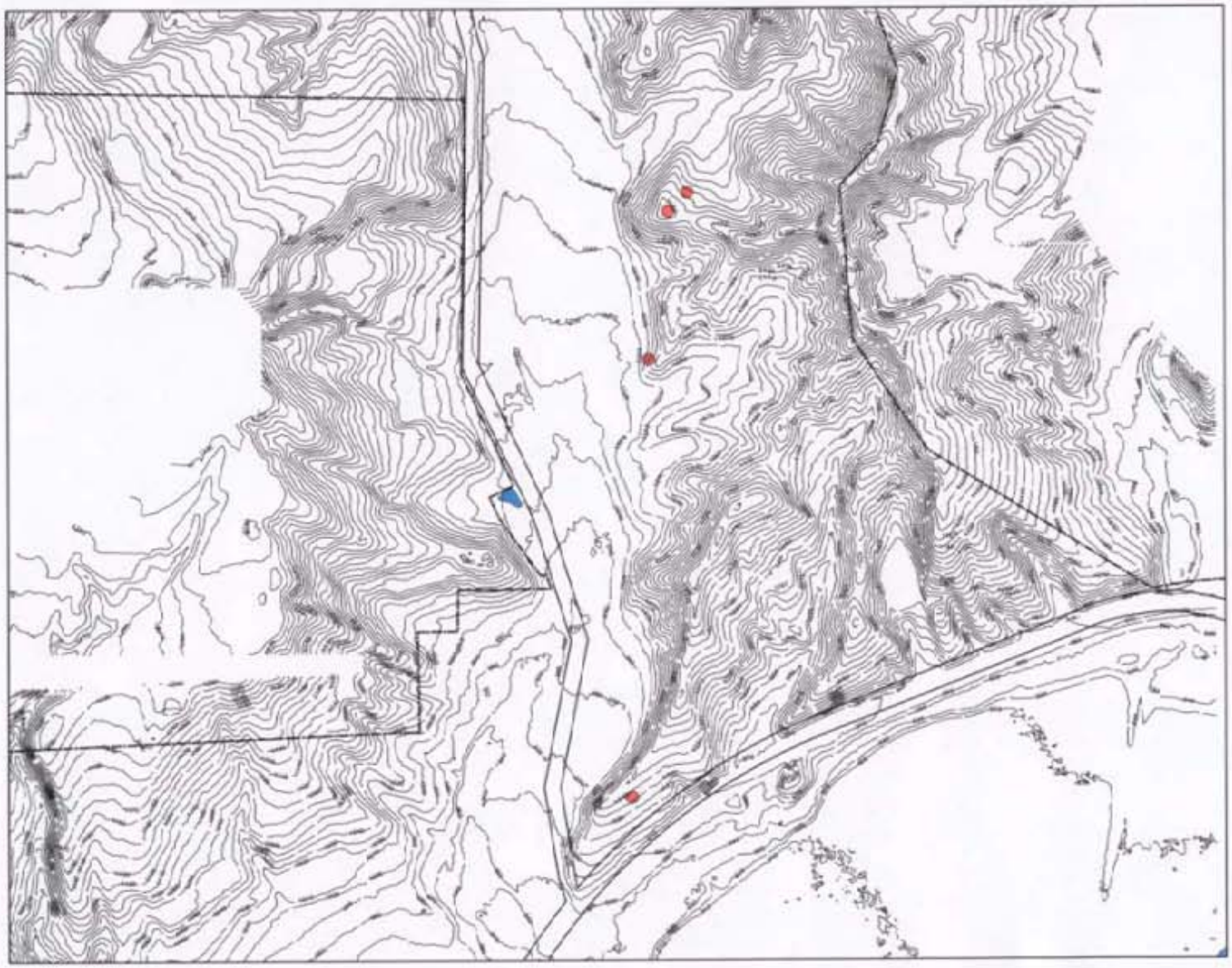
Meters 0 50 100

Feet 0 150 300

FORMA

Figure 4

RARE PLANT LOCATIONS



NEWHALL RANCH

LEGEND

Southern California Black Walnut

Peirson's Morning-Glory

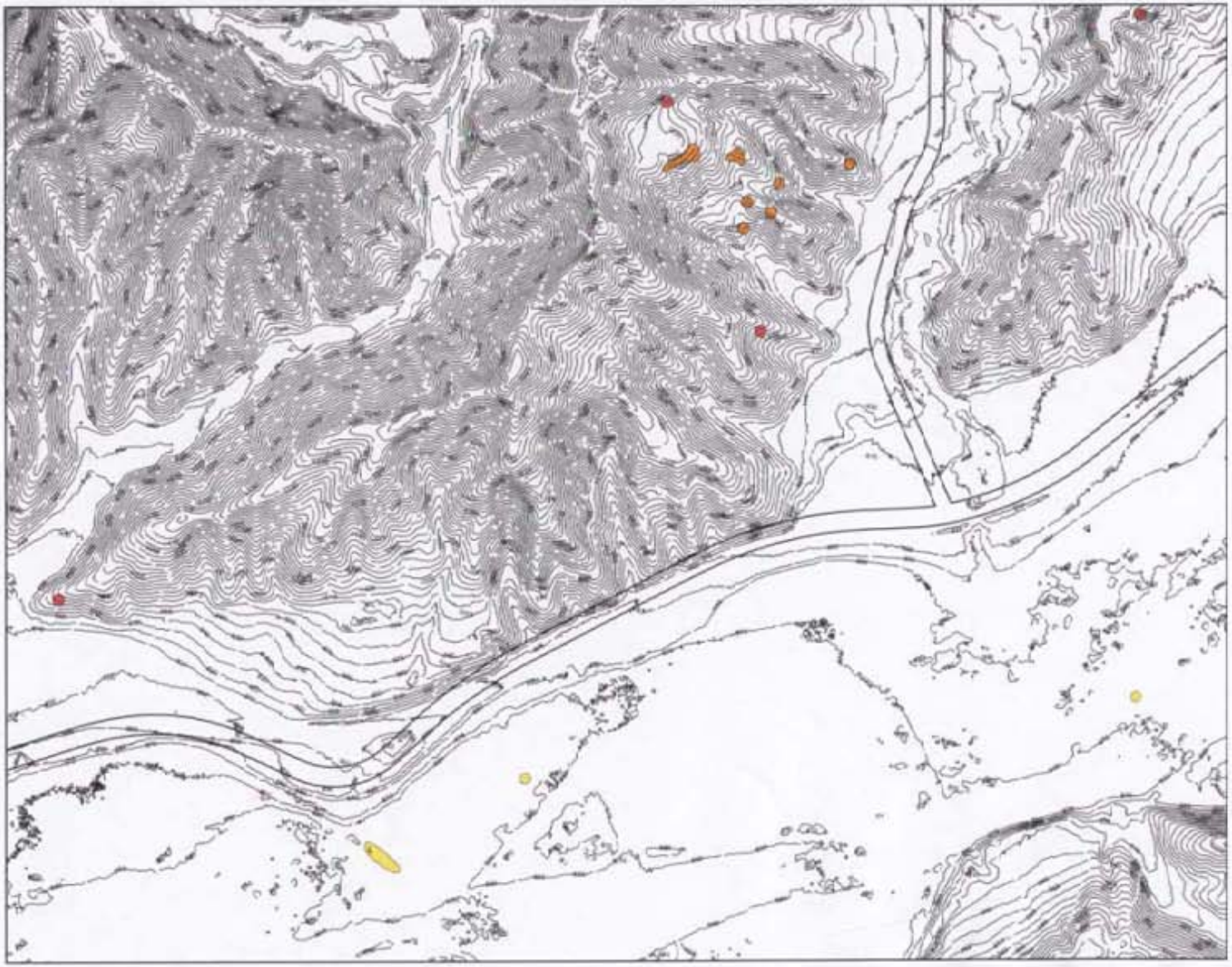
Meters 0 55 110

Feet 0 175 350

FORMA

Figure 5

RARE PLANT LOCATIONS



NEWHALL RANCH

L E G E N D

- Peirson's Morning-Glory
- San Fernando Valley Spineflower
- Southwestern Spiny Rush

FORMA

Figure 6

RARE PLANT LOCATIONS

Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) populations were found in three locations in secondary channels of the floodplain of the Santa Clara River, on flat terrain (see Figure 6). Elevations ranged from 800 to 900 feet. The plants occurred on alluvial soils, and were associated mostly with wetland species.

1. One clump, with *Salix exigua*, *Baccharis salicifolia*, and *Ambrosia psilostachya*.
2. ~25 clumps, with *Juncus mexicanus*, *Baccharis salicifolia*, and *Leymus triticoides*.
3. ~15 clumps, with *Baccharis emoryi*, *Leymus triticoides*, *Polypogon monspeliensis*, and *Melica imperfecta*.

Southern California black walnut (*Juglans californica* var. *californica*) trees were scattered in six locations, five in the willow-cottonwood riparian forest of the Santa Clara River, and one along Chiquito Canyon Road (possibly planted) (see Figures 3, 4 and 5). The walnut trees were found on relatively flat terrain at elevations of 800 to 1000 feet. The six populations each have 5 to 10 trees.

3.2 Homestead/Homestead Estates/Chiquito Canyon Residential

Two sensitive species were found in this combined project site during the 2001 surveys. San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*; FC/SE/CNPS List 1B) and Peirson's morning-glory (*Calystegia peirsonii*; CNPS List 4) were located in the Homestead Estates site. Peirson's morning-glory (*Calystegia peirsonii*) also was found in the Homestead site; no rare plants were observed in the Chiquito Canyon Residential project site. A summary of the populations of these species located at the sites is provided below. These population locations, as numbered below, have been marked on the accompanying map (see Figure 6).

San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) populations were found in seven locations west of San Martinez Grande Canyon Road, on slopes with southern exposures. Elevations ranged from 1000 to 1200 feet, and the soils were sandy loams. Most of the plants were flowering, and were associated with grassland and coastal sage scrub species.

1. ~1000+ plants, with *Eriogonum fasciculatum*, *Artemisia californica*, *Erodium cicutarium*, *Bromus madritensis* ssp. *rubens*, and *Bromus hordeaceus*.
2. ~1000+ plants, with *Eriogonum fasciculatum*, *Artemisia californica*, *Erodium cicutarium*, *Bromus madritensis* ssp. *rubens*, and *Bromus hordeaceus*.
3. ~750 plants, with *Chorizanthe staticoides*, *Eriogonum fasciculatum*, *Artemisia californica*, *Bromus madritensis* ssp. *rubens*, and *Bromus hordeaceus*.
4. ~750 plants, with *Eriogonum fasciculatum*, *Artemisia californica*, *Bromus madritensis* ssp. *rubens*, and *Bromus hordeaceus*.
5. ~750 plants, with *Eriogonum fasciculatum*, *Artemisia californica*, *Erodium cicutarium*, and *Bromus madritensis* ssp. *rubens*.
6. ~10000+ plants, with *Eriogonum fasciculatum*, *Artemisia californica*, *Salvia leucophylla*, *Hirschfeldia incana*, and *Bromus madritensis* ssp. *rubens*.
7. ~500 plants, with *Eriogonum fasciculatum*, *Artemisia californica*, *Bromus madritensis* ssp.

rubens, and *Bromus hordeaceus*.

Peirson's morning-glory (***Calystegia peirsonii***) populations were found in six locations on slopes with different exposures. Elevations ranged from 950 to 1200 feet, and the soils were variable in texture. The first population was found in the Homestead Estates project site, and the other five populations in the Homestead site. Most plants were flowering, and were associated with grassland and coastal sage scrub species.

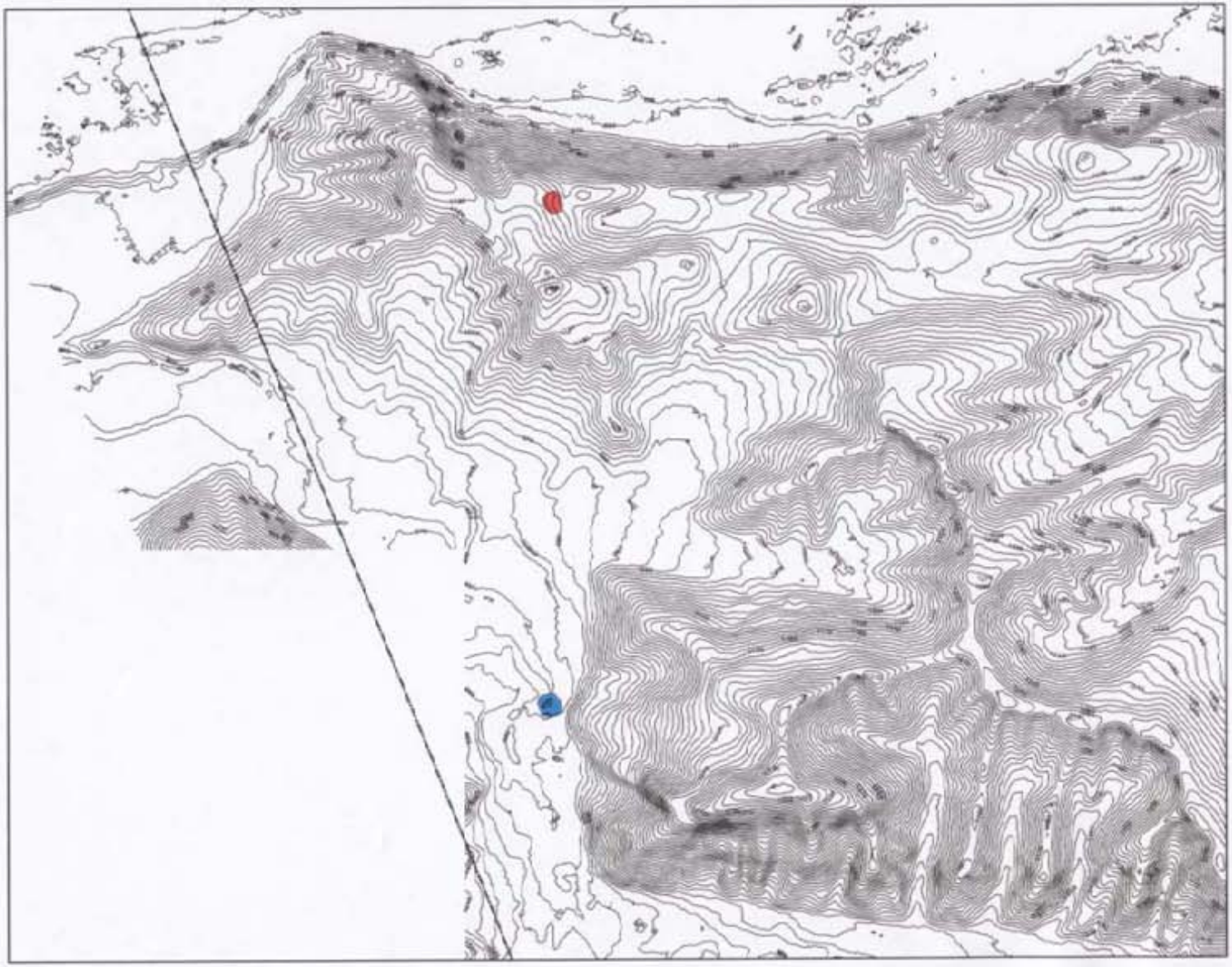
1. 5 plants, with *Bromus madritensis* ssp. *rubens* and *Bromus diandrus*.
2. 1 plant, with *Erodium cicutarium* and *Bromus* spp.
3. ~35 plants, with *Erodium cicutarium* and *Bromus madritensis* ssp. *rubens*, near *Eriogonum fasciculatum* and *Calystegia macrostegia*.
4. ~500 plants, with *Centaurea melitensis*, *Bromus* spp., and *Hirschfeldia incana*.
5. ~10 plants, with *Centaurea melitensis*, *Bromus* spp., and *Hirschfeldia incana*.
6. ~75 plants, with *Avena barbata*, *Centaurea melitensis*, *Lessingia filaginifolia*, *Eriogonum fasciculatum*, and *Salvia leucophylla*.

3.3 Salt Canyon

Two sensitive species were found in the Salt Canyon project site during the 2001 surveys: Peirson's morning-glory (*Calystegia peirsonii*) and southern California black walnut (*Juglans californica* var. *californica*), both CNPS List 4 species. A summary of the populations of these species located at the site is provided below. These population locations have been marked on the accompanying maps (see Figures 7 and 8).

Peirson's morning-glory (***Calystegia peirsonii***) was found in one location on a gentle east-facing slope, on clayey soil. The elevation was about 1050 feet (see Figure 7). The plants were flowering, and were associated with *Bromus madritensis* ssp. *rubens*, *Bromus hordeaceus*, *Salvia leucophylla*, and *Artemisia californica*; *Calystegia macrostegia* was found in the vicinity.

Southern California black walnut (***Juglans californica* var. *californica***) trees were scattered in two locations along the watercourse in Salt Canyon (see Figures 7 and 8). The first population had three trees, and was found at an elevation of about 950 feet, with *Artemisia californica*, *Salvia mellifera*, and *Salix lasiolepis*. The second population, found at about 1150 feet, had eight trees, and species associates were *Artemisia californica*, *Salvia leucophylla*, *Leymus condensatus*, and *Sambucus mexicana*.



NEWHALL RANCH

L E G E N D

Peirson's Morning-Glory

Southern California Black Walnut

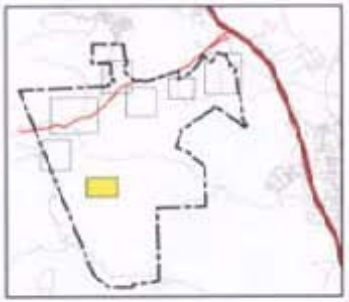
Figure 7

RARE PLANT LOCATIONS

NEWHALL RANCH

LEGEND

Southern California Black Walnut



Meters 0 55 110

Feet 0 175 350

FORMA November 2002

Figure 8

RARE PLANT LOCATIONS

3.4 Portions of Airport Mesa

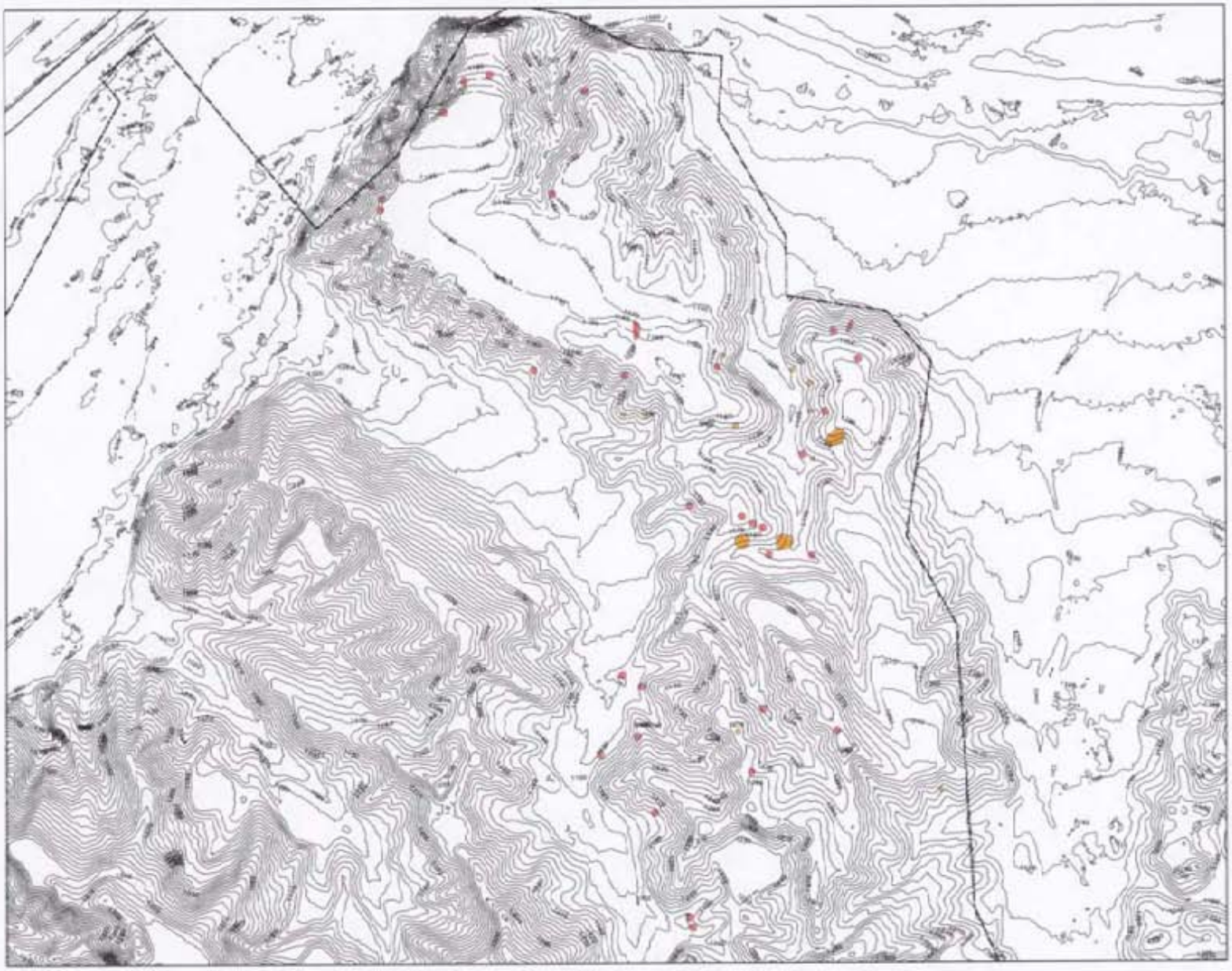
Two sensitive species were found in the Airport Mesa site during the 2002 surveys: San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*; FC/SE/CNPS List 1B) and Peirson's morning-glory (*Calystegia peirsonii*; CNPS List 4). A summary of the populations of these species located at the site is provided below. These population locations, as numbered below, have been marked on the accompanying map (see Figure 9).

San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) populations were found in 14 locations in the central, eastern, and southern parts of the site, mostly on slopes with southern exposures. Elevations ranged from 1100 to 1275 feet, and the soils were sandy loams. The plants were either in late flower, or had not flowered and were desiccated due to the lack of normal amounts of rainfall in 2002. They were associated with grassland and coastal sage scrub species.

1. ~50 plants, with *Eriogonum fasciculatum*, *Bromus madritensis* ssp. *rubens*, and *Erodium cicutarium*.
2. ~75 plants, with *Bromus madritensis* ssp. *rubens*, *Avena barbata*, near *Eriogonum fasciculatum*, *Artemisia californica*, and *Lessingia filaginifolia*.
3. 5 plants, with *Eriogonum fasciculatum*, *Bromus madritensis* ssp. *rubens*, near *Yucca whipplei*.
4. 11 plants, with *Opuntia littoralis*, *Bromus madritensis* ssp. *rubens*, *Erodium cicutarium*, and *Chamaesyce polycarpa*.
5. ~25 plants, with *Bromus madritensis* ssp. *rubens*, *Avena barbata*, and *Lastarriaea coriacea*, near *Artemisia californica* and *Eriogonum fasciculatum*.
6. ~100 plants, with *Bromus madritensis* ssp. *rubens* and *Eriogonum elongatum*.
7. ~75 plants, with *Bromus madritensis* ssp. *rubens*, *Artemisia californica*, near *Eriogonum fasciculatum* and *Prunus ilicifolia*.
8. 2 plants, at the base of a graded slope, with *Bromus madritensis* ssp. *rubens*, *Vulpia myuros*, and *Erodium cicutarium*.
9. 1 plant, at the base of a graded slope, with *Bromus diandrus*, *Bromus madritensis* ssp. *rubens*, and *Hirschfeldia incana*.
10. ~150 plants, on a graded slope/knoll, with *Bromus madritensis* ssp. *rubens* and *Avena barbata*.
11. 1 plant, at the base of a graded slope, with *Bromus madritensis* ssp. *rubens*, *Vulpia myuros*, and *Hirschfeldia incana*.
12. ~250 plants, on the lower parts of a graded slope, with *Bromus madritensis* ssp. *rubens*, *Deinandra fasciculata*, and *Ericameria palmeri* var. *pachylepis*.
13. ~20 plants, on the lower parts of a graded slope, with *Bromus madritensis* ssp. *rubens* and *Vulpia myuros*.
14. 4 plants, along a road below a graded slope, with *Ericameria palmeri* var. *pachylepis* and *Bromus madritensis* ssp. *rubens*.

Peirson's morning-glory (*Calystegia peirsonii*) populations were found in 32 locations on slopes with different exposures. Elevations ranged from 1100 to 1300 feet, and the soils were variable in texture. Most plants were flowering, and were associated with grassland and coastal sage scrub species.

1. ~50 plants, with *Salvia leucophylla* and *Bromus diandrus*, near *Eriogonum fasciculatum*.
2. ~120 plants, with *Eriogonum fasciculatum*, *Avena fatua*, and *Bromus madritensis* ssp. *rubens*.



NEWHALL RANCH

L E G E N D

Peirson's Morning-Glory

San Fernando Valley Spineflower

Meters 0 85 170

Feet 0 275 550

FORMA

Figure 9

RARE PLANT LOCATIONS

3. 5 plants, with *Artemisia californica* and *Bromus diandrus*.
4. ~20 plants, with *Salvia leucophylla, Artemisia californica, Eriogonum fasciculatum, Bromus madritensis* ssp. *rubens*, and *Nassella lepida*.
5. ~20 plants, with *Artemisia californica, Eriogonum fasciculatum, Nassella lepida*, and *Salvia leucophylla*.
6. ~20 plants, with *Artemisia californica, Eriogonum fasciculatum*, and *Bromus madritensis* ssp. *rubens*.
7. ~25 plants, with *Bromus hordeaceus, Bromus madritensis* ssp. *rubens*, and *Lotus scoparius*.
8. ~2500+ plants, with *Bromus madritensis* ssp. *rubens, Eriogonum elongatum, Ericameria palmeri* var. *pachylepis, Artemisia californica*, and *Artemisia tridentata*.
9. ~40 plants, with *Eriogonum fasciculatum, Artemisia californica*, and *Bromus diandrus*.
10. ~2500+ plants, with *Lessingia filaginifolia, Bromus madritensis* ssp. *rubens, Ericameria palmeri* var. *pachylepis*, and *Bromus diandrus*.
11. ~300 plants, under *Quercus lobata*, with *Artemisia californica, Ericameria palmeri* var. *pachylepis, Lessingia filaginifolia*, and *Bromus madritensis* ssp. *rubens*.
12. ~200 plants, with *Eriogonum fasciculatum, Ericameria palmeri* var. *pachylepis*, and *Bromus madritensis* ssp. *rubens*.
13. 5 plants, with *Eriogonum fasciculatum* and *Bromus madritensis* ssp. *rubens*, near *Artemisia californica*.
14. 5 plants, with *Bromus madritensis* ssp. *rubens*.
15. ~350 plants, with *Artemisia tridentata, Ericameria palmeri* var. *pachylepis*, and *Bromus madritensis* ssp. *rubens*.
16. ~250 plants, with *Bromus madritensis* ssp. *rubens, Ericameria palmeri* var. *pachylepis*, and *Salvia apiana*.
17. ~250 plants, with *Mirabilis californica, Artemisia californica*, and *Bromus madritensis* ssp. *rubens*.
18. ~400 plants, with *Ericameria palmeri* var. *pachylepis, Salvia leucophylla, Eriogonum fasciculatum*, and *Bromus madritensis* ssp. *rubens*.
19. ~400 plants, with *Salvia leucophylla, Artemisia californica, Eriogonum fasciculatum*, and *Bromus madritensis* ssp. *rubens*.
20. ~25 plants, with *Eriogonum fasciculatum* and *Bromus madritensis* ssp. *rubens*.
21. ~300 plants, with *Artemisia dracunculus, Ericameria palmeri* var. *pachylepis, Salvia leucophylla, Eriogonum fasciculatum* and *Bromus madritensis* ssp. *rubens*.
22. ~350 plants, with *Eriogonum fasciculatum, Artemisia californica*, and *Bromus madritensis* ssp. *rubens*.
23. ~100 plants, with *Bromus madritensis* ssp. *rubens* and *Avena barbata*, near *Ericameria palmeri* var. *pachylepis* and *Eriogonum fasciculatum*.
24. ~50 plants, with *Avena barbata, Bromus madritensis* ssp. *rubens*, and *Erodium cicutarium*, near *Yucca whipplei* and *Artemisia californica*.
25. ~10 plants, at the base of a graded slope, with *Bromus madritensis* ssp. *rubens*.
26. 5 plants, at the base of a graded slope, with *Bromus madritensis* ssp. *rubens*.
27. ~10 plants, at the base of a graded slope, with *Avena barbata, Erodium cicutarium*, and *Bromus madritensis* ssp. *rubens*.
28. ~25 plants, on a graded slope, with *Avena barbata, Erodium cicutarium*, and *Vulpia myuros*.

29. ~20 plants, on a graded slope, with *Avena barbata*, *Bromus madritensis* ssp. *rubens*, and *Vulpia myuros*.
30. ~50 plants, on a graded slope, with *Bromus madritensis* ssp. *rubens*, near *Ericameria palmeri* var. *pachylepis*.
31. ~15 plants, at the base of a graded slope, with *Ericameria palmeri* var. *pachylepis* and *Bromus madritensis* ssp. *rubens*.
32. ~50 plants, on a graded slope, with *Bromus madritensis* ssp. *rubens* and *Vulpia myuros*.

4. PLANT SPECIES LIST

Plant species observed in the Newhall Ranch Specific Plan project sites are listed below.

FERNS AND FERN-ALLIES
Equisetaceae
Equisetum laevigatum
Pteridaceae
Pentagramma triangularis ssp. *triangularis*

Selaginellaceae
Selaginella bigelovii
ANGIOSPERMS
DICOTYLEDONS
Anacardiaceae
Rhus trilobata
*Schinus molle**
Toxicodendron diversilobum
Apiaceae
Apiastrum angustifolium
Bowlesia incana
Yabea microcarpa
Asclepiadaceae
Asclepias fascicularis
Asteraceae
Acourtia microcephala
Ambrosia acanthicarpa
Ambrosia psilostachya
Artemisia californica
Artemisia douglasiana
Artemisia dracunculus
Artemisia tridentata
Baccharis emoryi
Baccharis pilularis
Baccharis salicifolia
Brickellia californica
Brickellia nevinii

*Carduus pycnocephalus**
*Centaurea melitensis**
*Centaurea solstitialis**
Chaenactis glabriuscula var. *glabriuscula*
Deinandra fasciculata
Encelia californica
Encelia farinosa
Ericameria palmeri var. *pachylepis*
Eriophyllum confertiflorum
Filago californica
*Filago gallica**
Gnaphalium californicum
Hazardia squarrosa
Heterotheca grandiflora
Heterotheca sessiliflora ssp. *echioides*
Heterotheca sessiliflora ssp. *fastigiata*
Isocoma menziesii var. *menziesii*
Iva axillaris ssp. *robustior*
Lepidospartum squamatum
Lessingia filaginifolia
Lessingia glandulifera var. *glandulifera*
Malacothrix saxatilis var. *commutata*
Pluchea sericea
Psilocarphus tenellus
*Silybum marianum**
Stylocline gnaphaloides
Boraginaceae
Amsinckia menziesii var. *intermedia*
Cryptantha micrantha
Heliotropium curassavicum
Pectocarya linearis ssp. *ferocula*
Plagiobothrys nothofulvus
Brassicaceae
*Brassica nigra**
*Hirschfeldia incana**
Rorippa nasturtium-aquaticum
*Sisymbrium irio**
Cactaceae
Opuntia basilaris var. *basilaris*
Opuntia littoralis
Capparaceae
Isomeris arborea
Caprifoliaceae
Sambucus mexicana
Chenopodiaceae

Atriplex canescens ssp. *linearis*
Atriplex lentiformis
*Atriplex semibaccata**
*Chenopodium album**
*Salsola tragus**
Convolvulaceae
Calystegia macrostegia ssp. *cyclostegia*
Calystegia peirsonii†
Crassulaceae
Crassula connata
Dudleya lanceolata

Cucurbitaceae
Cucurbita foetidissima
Marah macrocarpus var. *macrocarpus*
Euphorbiaceae
Chamaesyce polycarpa
Croton californicus
Eremocarpus setigerus
*Ricinus communis**
Fabaceae
Astragalus trichopodus var. *phoxus*
Lotus salsuginosus var. *salsuginosus*
Lotus scoparius
Lupinus bicolor
Lupinus latifolius
Lupinus succulentus
*Melilotus indicus**
Fagaceae
Quercus agrifolia var. *agrifolia*
Quercus berberidifolia
Quercus lobata
Geraniaceae
*Erodium cicutarium**
Grossulariaceae
Ribes aureum
Hydrophyllaceae
Eriodictyon crassifolium var. *nigrescens*
Eucrypta chrysanthemifolia
Phacelia ramosissima var. *ramosissima*
Juglandaceae
Juglans californica var. *californica*†
Lamiaceae
*Marrubium vulgare**
Salvia apiana

Salvia leucophylla
Salvia mellifera
Trichostema lanceolatum
Malvaceae
Malacothamnus fasciculatus
Myrtaceae
*Eucalyptus globulus**
Nyctaginaceae
Mirabilis californica
Onagraceae
Camissonia bistorta
Camissonia boothii ssp. *decorticans*
Camissonia campestris ssp. *campestris*
Camissonia californica
Camissonia hirtella
Camissonia micrantha
Clarkia cylindrica ssp. *cylindrica*
Clarkia epilobioides
Clarkia purpurea ssp. *quadrivulnera*
Clarkia unguiculata
Epilobium canum
Oenothera californica ssp. *californica*
Paeoniaceae
Paeonia californica
Papaveraceae
Eschscholzia californica
Polemoniaceae
Eriastrum densifolium ssp. *elongatum*
Eriastrum sapphirinum
Gilia angelensis
Leptodactylon californicum
Navarretia atractyloides
Polygonaceae
Chorizanthe parryi var. *fernandina*†
Chorizanthe staticoides
Eriogonum baileyi
Eriogonum elongatum var. *elongatum*
Eriogonum fasciculatum var. *foliolosum*
Eriogonum gracile
Eriogonum gracillimum
Lastarriaea coriacea
Portulacaceae
Calyptridium monandrum
Claytonia perfoliata
Ranunculaceae

Delphinium parryi ssp. *parryi*
Rhamnaceae
Ceanothus crassifolius
Rhamnus crocea
Rhamnus ilicifolia

Rosaceae
Adenostoma fasciculatum
Cercocarpus betuloides var. *betuloides*
Heteromeles arbutifolia
Prunus ilicifolia ssp. *ilicifolia*
Rosa californica
Rubus ursinus
Rubiaceae
Galium angustifolium ssp. *angustifolium*
Galium aparine[*?]
Galium californicum ssp. *flaccidum*
Galium nuttallii ssp. *nuttallii*
Salicaceae
Populus fremontii ssp. *fremontii*
Salix exigua
Salix laevigata
Salix lasiolepis
Saururaceae
Anemopsis californica
Scrophulariaceae
Antirrhinum coulterianum
Castilleja affinis ssp. *affinis*
Castilleja exserta
Castilleja foliolosa
Collinsia parryi
Keckiella cordifolia
Mimulus aurantiacus
Penstemon centranthifolius
*Veronica anagallis-aquatica**
Solanaceae
Datura wrightii
*Nicotiana glauca**
Solanum xanti
Tamaricaceae
Tamarix sp.*
Urticaceae
Urtica dioica ssp. *holosericea*
Violaceae
Viola pedunculata

ANGIOSPERMS
MONOCOTYLEDONS
Cyperaceae
Cyperus esculentus
Scirpus acutus var. *occidentalis*
Scirpus americanus
Scirpus californicus
Scirpus maritimus
Juncaceae
Juncus acutus ssp. *leopoldii*†
Juncus effusus
Juncus mexicanus
Liliaceae
Calochortus clavatus ssp. *pallidus*
Dichelostemma capitatum
Yucca whipplei
Poaceae
*Arundo donax**
*Avena barbata**
*Avena fatua**
*Bromus diandrus**
*Bromus hordeaceus**
Bromus madritensis ssp. *rubens**
*Bromus tectorum**
*Cynodon dactylon**
Distichlis spicata
*Hordeum murinum**
Koeleria macrantha
Leymus condensatus
Leymus triticoides
Melica imperfecta
Nassella lepida
Nassella pulchra
Poa secunda ssp. *secunda*
*Polypogon monspeliensis**
*Schismus barbatus**
*Vulpia myuros**
Typhaceae
Typha angustifolia
Typha latifolia

* Non-native plant species
*? Possible non-native plant species
† Sensitive plant species

5. REFERENCES

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Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Unpublished Report. State of California, The Resources Agency, Department of Fish and Game, Natural Heritage Division, Sacramento, California.

Rare Plant Surveys

RARE PLANT SURVEYS FOR *HELIANTHUS* SP.

RIVER VILLAGE AND WATER RECLAMATION PLANT

LOS ANGELES COUNTY, CA

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1. INTRODUCTION

This report documents the results of rare plant surveys conducted at the River Village and Water Reclamation Plant sites within the Newhall Ranch project area in Los Angeles County, California. The River Village site is located on the north side of the Santa Clara River, between Chiquito Canyon in the west and Castaic Creek in the east. The Water Reclamation Plant site also is located on the north side of the Santa Clara River, just east of the Los Angeles County line.

A team of two consultants from FLx (Dr. Anuja Parikh and Dr. Nathan Gale) conducted the rare plant surveys on October 16 and 17, 2002. The focus of the surveys was the Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*), which is found in wetland habitats; the surveys, therefore, concentrated on the wetter areas of the two sites. Upland areas of the River Village and Water Reclamation sites were not examined in detail, since they already had been surveyed for rare plants in Spring 2001. During the current surveys, wetland vegetation types and plant species associations were noted and their dominant species were recorded. A list of observed plant species, including rare and commonly occurring plants, was compiled. Plant community descriptions in this report follow Holland (1986) where applicable; species nomenclature follows Hickman (1993).

2. VEGETATION TYPES AND PLANT SPECIES ASSOCIATIONS

The River Village and Water Reclamation Plant sites lie on flat terraces above the Santa Clara River. The terraces are used primarily for agriculture. The wetter areas of the project sites, where the surveys were conducted, occur in and along the edges of the river floodplain, and are composed of relatively flat terrain in the main and secondary channels of the river, as well as the slopes of the riverbanks.

Riverwash. In areas where scouring has occurred, the main channel of the Santa Clara River is relatively sparsely vegetated. The soils in these scoured areas are sandy riverwash and gravel, and in places form sand bars and low terraces within the channel. No well-defined plant community is found here, although scattered elements of riparian scrub were observed. Shrub species found in and adjacent to the channel include mule fat (*Baccharis salicifolia*), sandbar willow (*Salix exigua*), tamarisk (*Tamarix* sp.), scale-broom (*Lepidospartum squamatum*), sandwash groundsel (*Senecio flaccidus* var. *douglasii*), big saltbush (*Atriplex lentiformis* ssp. *lentiformis*), and Great Basin sagebrush (*Artemisia tridentata*). Other plants growing in these areas include white sweetclover (*Melilotus albus*), annual bur-sage (*Ambrosia acanthicarpa*), cocklebur (*Xanthium strumarium*), California croton (*Croton californicus*), buckwheat (*Eriogonum baileyi*), California evening primrose (*Oenothera californica* ssp. *californica*), Mediterranean schismus (*Schismus barbatus*), and foxtail chess (*Bromus madritensis* ssp. *rubens*).

Freshwater Marsh. Small patches of wet areas in the main and secondary channels of the Santa Clara River in the River Village and Water Reclamation Plant sites have freshwater marsh vegetation. This community typically is dominated by emergent perennial monocots, often up to 5 m tall and forming closed canopies. Marshes are found on relatively deep organic soils on sites permanently flooded with fresh water (Holland, 1986). Species found in the wettest parts of the channels are cattails (*Typha latifolia, T. domingensis*), smartweeds (*Polygonum hydropiperoides, P. punctatum*), bulrushes (*Scirpus acutus* var. *occidentalis, S. pungens*), nutsedge (*Cyperus odoratus*), water primrose (*Ludwigia peploides* ssp. *peploides*), water cress (*Rorippa nasturtium-aquaticum*), sticky willowweed (*Epilobium ciliatum* ssp.

ciliatum), and water speedwell (*Veronica anagallis-aquatica*). With respect to sensitivity status, freshwater marsh has been state-ranked as S2.1 (2,000 to 10,000 acres, very threatened) by the California Natural Diversity Database (CNDDB).

Mule Fat Scrub. Mule fat scrub is found in linear patches along the main and secondary channels of the Santa Clara River. Mule fat scrub typically is a tall, semi-woody and herbaceous riparian scrub, and is relatively species-poor. An early seral community, it often grades to riparian woodland or forest (Holland, 1986). The dominant species in this community is mule fat (*Baccharis salicifolia*); arrow weed (*Pluchea sericea*), tree tobacco (*Nicotiana glauca*), tamarisk (*Tamarix* sp.), and giant reed (*Arundo donax*) also are common. The understory is sparse or absent, but sometimes includes species such as Mexican rush (*Juncus mexicanus*), salt heliotrope (*Heliotropium curassavicum*), and grasses. With respect to sensitivity status, mule fat scrub has been state-ranked as S4 (apparently secure) by the CNDDB.

Southern Cottonwood-Willow Riparian Forest. This community occurs on low terraces above the main channel of the Santa Clara River. It consists of tall, open, broadleaved, winter-deciduoustrees, and is dominated by Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) and willows (*Salix laevigata, S. exigua, S. lasiolepis*). These species require moist, bare mineral soil for germination and establishment, provided after floodwaters recede; this forest type therefore is found mostly along perennially wet streams (Holland, 1996). Understory plants include mule fat (*Baccharis salicifolia*), arrow weed (*Pluchea sericea*), Mexican elderberry (*Sambucus mexicana*), southern California black walnut (*Juglans californica* var. *californica*), mugwort (*Artemisia douglasiana*), hoary nettle (*Urtica dioica* ssp. *holosericea*), ripgut grass (*Bromus diandrus*), and alkali rye (*Leymus triticoides*). With respect to sensitivity status, southern cottonwood-willow riparian forest has been state-ranked as S3.2 (10,000 to 50,000 acres, threatened) by the CNDDB.

3. RARE PLANT SPECIES

In June 2002, a sunflower species was found in a marsh on Newhall Ranch property on the south bank of the Santa Clara River, and was thought possibly to be the Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*), presumed extinct. Following later field visits in August and September when the plants were flowering, samples were sent for identification to Rancho Santa Ana Botanic Garden, University of California, Berkeley, and to Indiana University. The plants have not been identified conclusively to date as the rare taxon, and may be Nuttall's sunflower (*Helianthus nuttallii* ssp. *nuttallii*) or California sunflower (*Helianthus californicus*). Since the rare plant blooms from August to October, the current surveys were conducted in October 2002 to search specifically for the Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*) before the end of its blooming period. The surveys concentrated on wetland habitats, and other target species potentially occurring in wetlands also were included in the search.

A list of target species for the current surveys at the River Village and Water Reclamation Plant sites is presented in Table 1. In addition to the Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*), the species included in the table are those that occur in wetland habitats and are late-blooming species or potentially are identifiable late in the year.

TABLE 1: SENSITIVE PLANT SPECIES POTENTIALLY OCCURRING IN WET AREAS ON THE NEWHALL RANCH PROPERTY

Scientific Name	Common Name	Family	Status* Federal/State/CNPS
Arenaria paludicola	Marsh sandwort	Caryophyllaceae	FE/SE/1B
Berberis nevinii	Nevin's barberry	Berberidaceae	FE/SE/1B
Helianthus nuttallii ssp. *parishii*	Los Angeles sunflower	Asteraceae	-/-/1A
Juglans californica var. *californica*	Southern California black walnut	Juglandaceae	-/-/4
Juncus acutus ssp. *leopoldii*	Southwestern spiny rush	Juncaceae	-/-/4
Malacothamnus davidsonii	Davidson's bush mallow	Malvaceae	-/-/1B
Muhlenbergia californica	California muhly	Poaceae	-/-/4
Rorippa gambelii	Gambel's watercress	Brassicaceae	FE/ST/1B
Sidalcea neomexicana	Salt spring checkerbloom	Malvaceae	-/-/2
Thelypteris puberula var. *sonorensis*	Sonoran maiden fern	Thelypteridaceae	-/-/2

* FE = Federal endangered
SE = State/California endangered
ST = State/California threatened
1A = CNPS List 1A, presumed extinct in California
1B = CNPS List 1B, rare or endangered in California and elsewhere
2 = CNPS List 2, rare or endangered in California, more common elsewhere
4 = CNPS List 4, plants of limited distribution

The Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*) was not found at the River Village and Water Reclamation Plant sites during the October 2002 surveys. A few scattered plants of common sunflower (*Helianthus annuus*) and slender sunflower (*Helianthus gracilentus*) were observed.

At the River Village site, one new (i.e., in addition to those found in Spring 2001) location each was found of the CNPS List 4 sensitive species **southern California black walnut (*Juglans californica* var. *californica*)** and **southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*)**. Two southern California black walnut (*Juglans californica* var. *californica*) trees were found in the willow-cottonwood riparian forest of the Santa Clara River on relatively flat terrain at an elevation of about 940 feet. About ten clumps of southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) were found with *Baccharis salicifolia* and *Scirpus microcarpus* on a low terrace in the riverbed at 925 feet.

At the Water Reclamation Plant site, four additional populations of **southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*)** were found in secondary channels and on a low terrace on flat terrain, at about 850 feet. The plants occurred on alluvial soils, and were associated mostly with wetland species. A summary of these populations is provided below, and their locations have been marked on the accompanying map.

1. ~25 clumps, with *Pluchea sericea*, *Baccharis salicifolia*, and *Tamarix* sp.
2. 5 clumps, with *Arundo donax*, *Tamarix* sp., and *Baccharis salicifolia*.
3. 6 clumps, with *Tamarix* sp., *Scirpus americanus*, and *Heliotropium curassavicum*.
4. ~50 clumps, scattered over a relatively large area, with *Populus fremontii* ssp. *fremontii*, *Baccharis salicifolia*, and *Tamarix* sp.

4. PLANT SPECIES LIST

Plant species observed at the River Village and Water Reclamation Plant sites are listed below.

FERNS AND FERN-ALLIES
Azollaceae
Azolla filiculoides
Equisetaceae
Equisetum laevigatum
ANGIOSPERMS
DICOTYLEDONS
Asteraceae
Ambrosia acanthicarpa
Ambrosia psilostachya
Artemisia californica
Artemisia douglasiana
Artemisia tridentata
Baccharis emoryi
Baccharis pilularis
Baccharis salicifolia
Conyza canadensis
Euthamia occidentalis
*Gnaphalium luteo-album**
Gnaphalium stramineum
Helianthus annuus
Helianthus gracilentus
Heterotheca grandiflora
Heterotheca sessiliflora ssp. *fastigiata*
Lepidospartum squamatum
Pluchea odorata
Pluchea sericea
*Pulicaria paludosa**
Senecio flaccidus var. *douglasii*
Xanthium strumarium
Boraginaceae
Heliotropium curassavicum
Brassicaceae
*Brassica nigra**
*Hirschfeldia incana**
*Lepidium latifolium**
Rorippa nasturtium-aquaticum
Cactaceae
Opuntia littoralis
Opuntia prolifera
Capparaceae
Isomeris arborea
Caprifoliaceae
Sambucus mexicana
Chenopodiaceae
Atriplex lentiformis
*Salsola tragus**
Euphorbiaceae
Croton californicus
Fabaceae
Lotus scoparius
*Melilotus albus**
Fagaceae
Quercus agrifolia var. *agrifolia*
Hydrophyllaceae
Eriodictyon crassifolium var. *nigrescens*
Juglandaceae
Juglans californica var. *californica*†
Lamiaceae
*Marrubium vulgare**
Onagraceae
Epilobium canum
Epilobium ciliatum ssp. *ciliatum*
Ludwigia peploides ssp. *peploides*
Oenothera californica ssp. *californica*
Oenothera elata ssp. *hirsutissima*
Plantaginaceae
*Plantago major**
Platanaceae
Platanus racemosa
Polygonaceae
Eriogonum baileyi
Eriogonum brachyanthum
Eriogonum fasciculatum var. *foliolosum*
Eriogonum gracile
Polygonum hydropiperoides
Polygonum punctatum
*Rumex crispus**
Rosaceae
Rosa californica
Rubus ursinus

Salicaceae
Populus fremontii ssp. *fremontii*
Salix exigua
Salix laevigata
Salix lasiolepis
Saururaceae
Anemopsis californica
Scrophulariaceae
*Veronica anagallis-aquatica**
Solanaceae
Datura wrightii
*Nicotiana glauca**
Solanum douglasii
Tamaricaceae
Tamarix sp.*
Urticaceae
Urtica dioica ssp. *holosericea*
ANGIOSPERMS
MONOCOTYLEDONS
Cyperaceae
Cyperus odoratus
Eleocharis parishii
Scirpus acutus var. *occidentalis*
Scirpus americanus
Scirpus californicus
Scirpus microcarpus
Scirpus pungens
Juncaceae
Juncus acutus ssp. *leopoldii*[†]
Juncus mexicanus
Juncus textilis
Lemnaceae
Lemna minuscula
Poaceae
*Arundo donax**
*Avena barbata**
*Avena fatua**
*Bromus diandrus**
*Bromus hordeaceus**
Bromus madritensis ssp. *rubens**
Distichlis spicata
Leymus triticoides
*Polypogon monspeliensis**
*Schismus barbatus**
*Vulpia myuros**
Typhaceae
Typha domingensis
Typha latifolia

* Non-native plant species
*/ Possible non-native plant species
† Sensitive plant species

5. REFERENCES

Hickman, J.C. (Editor). 1993. The Jepson Manual, Higher Plants of California. University of California Press, Berkeley, California.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Unpublished Report. State of California, The Resources Agency, Department of Fish and Game, Natural Heritage Division, Sacramento, California.

Oak Tree Surveys

FORTHCOMING WILL BE INCLUDED UPON FINAL SUBMITTAL