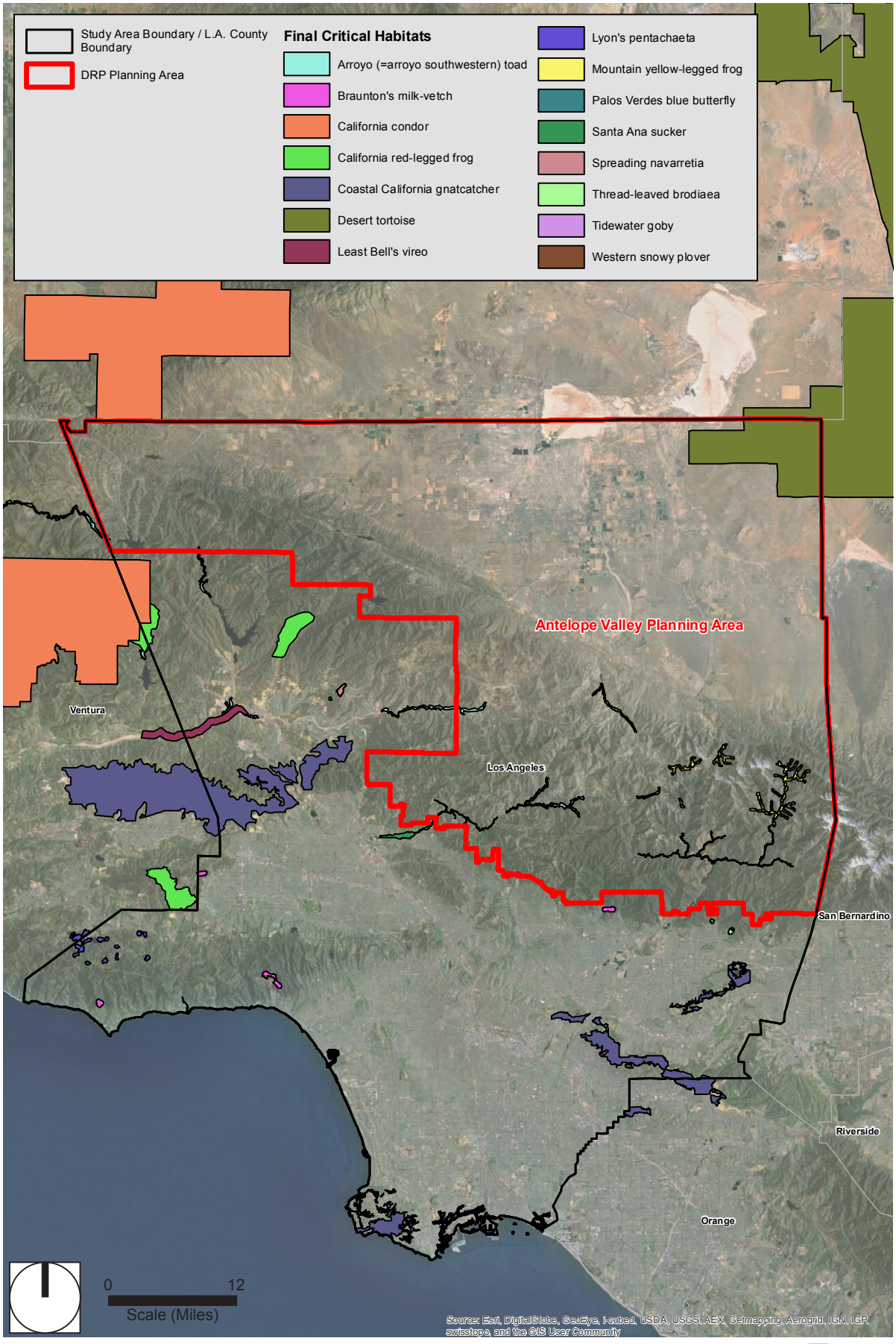
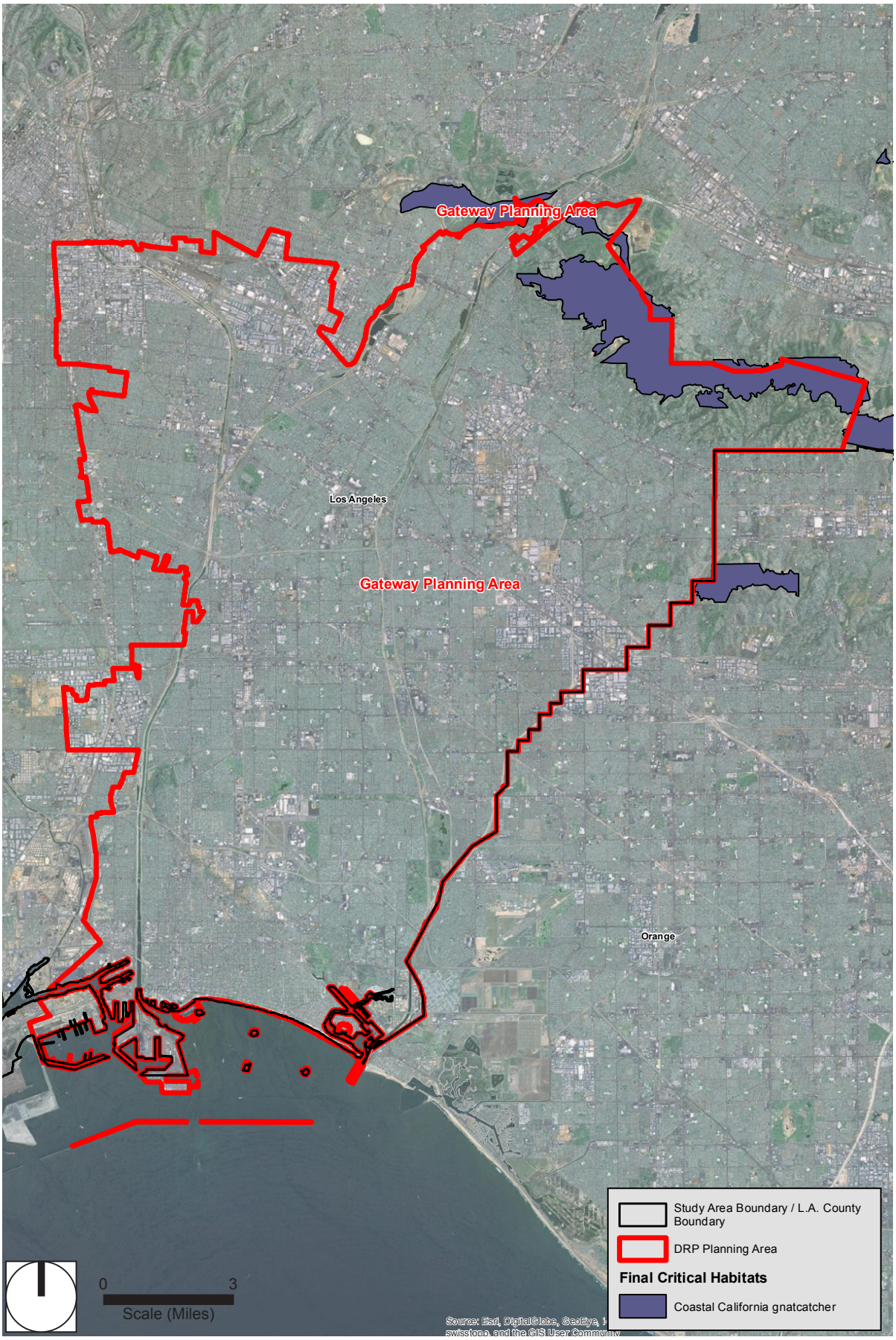
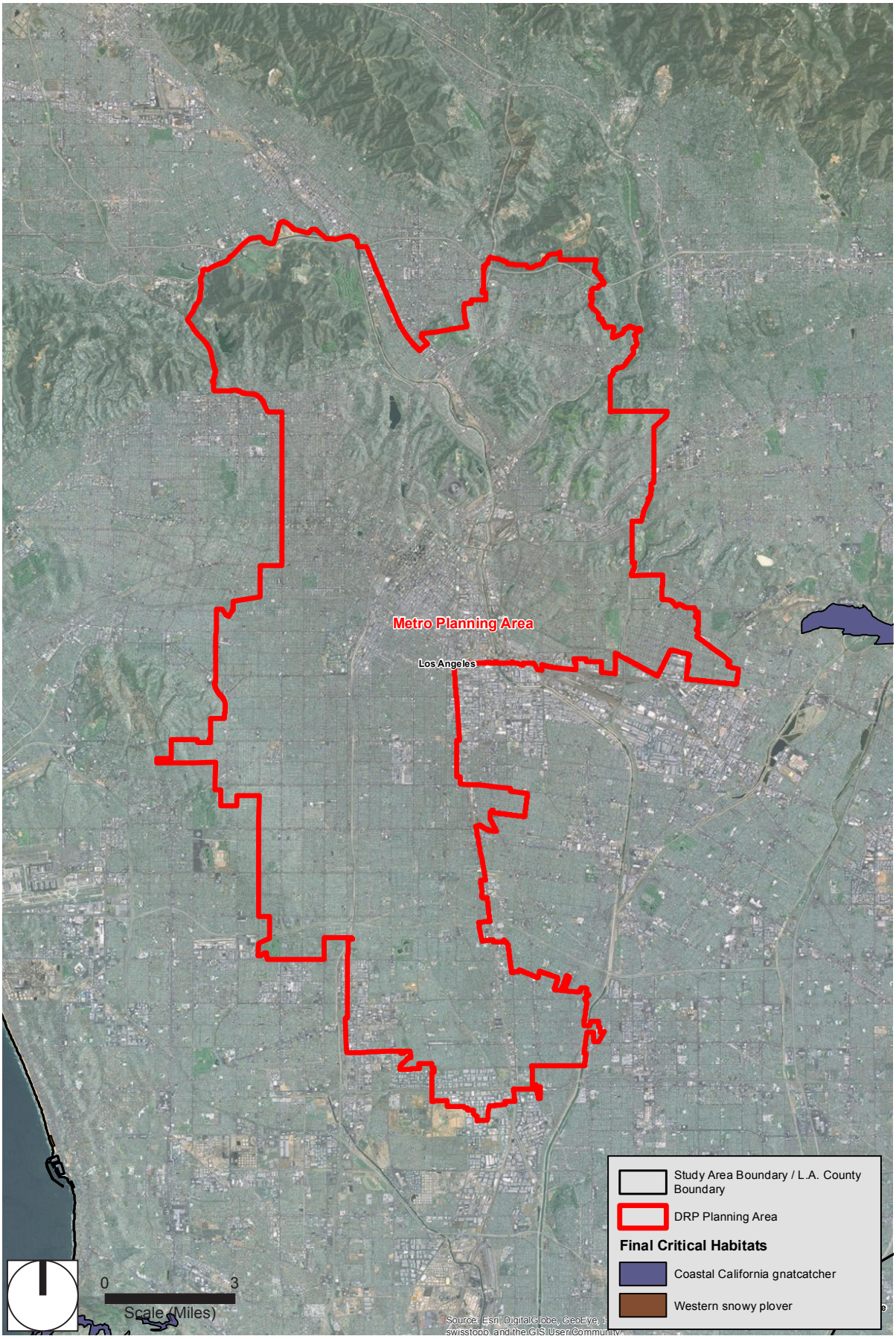
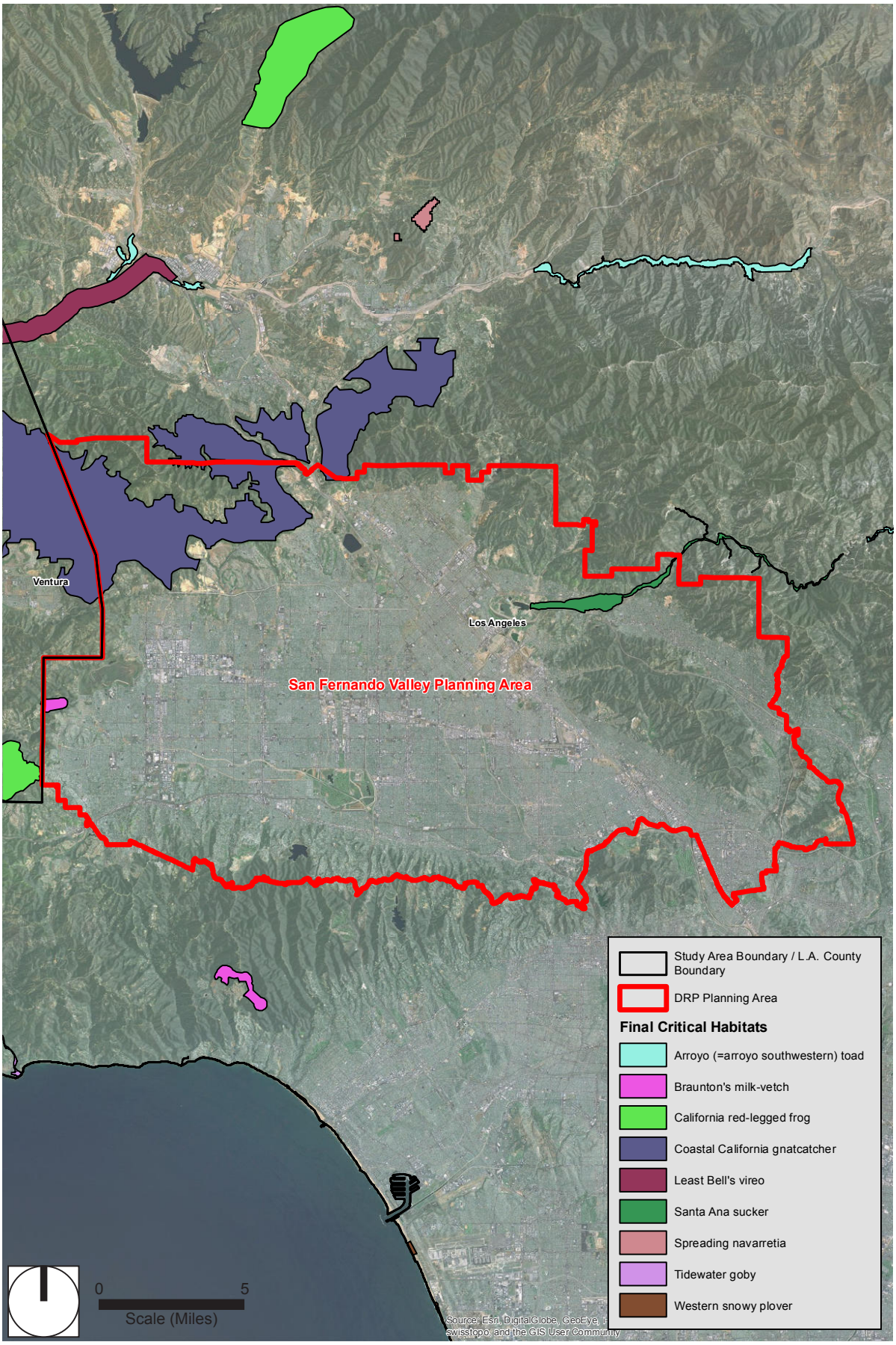
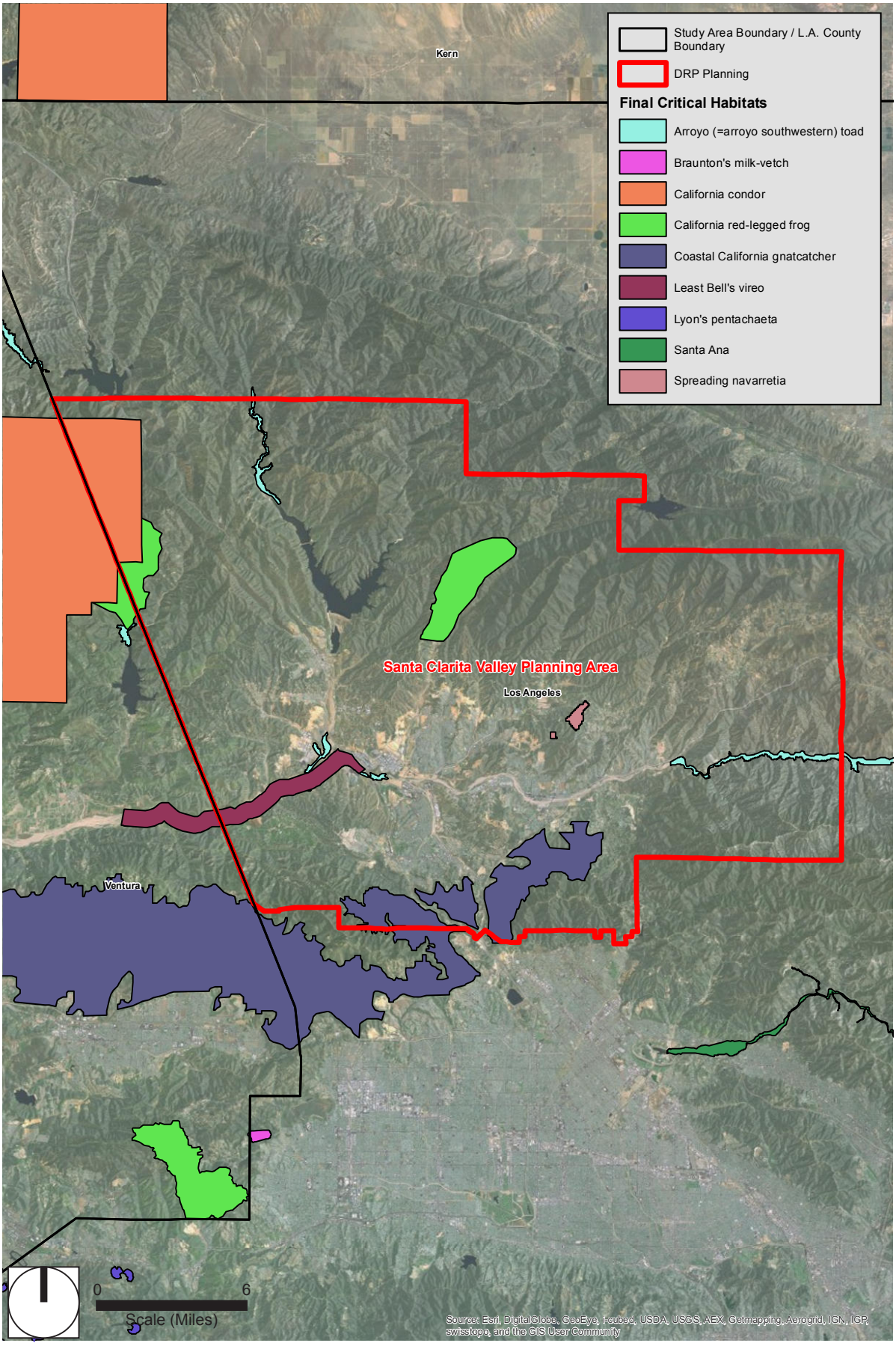

Study Area Boundary / L.A. County Boundary
DRP Planning Area
Final Critical Habitats
Arroyo (=arroyo southwestern) toad
Braunton's milk-vetch
California condor
California red-legged frog
Coastal California gnatcatcher
Desert tortoise
Least Bell's vireo
Lyon's pentachaeta
Mountain yellow-legged frog
Palos Verdes blue butterfly
Santa Ana sucker
Spreading navarretia
Thread-leaved brodiaea
Tidewater goby
Western snowy plover
Antelope Valley Planning Area
Ventura
Los Angeles
San Bernardino
Riverside
Orange
0
12
Scale (Miles)
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

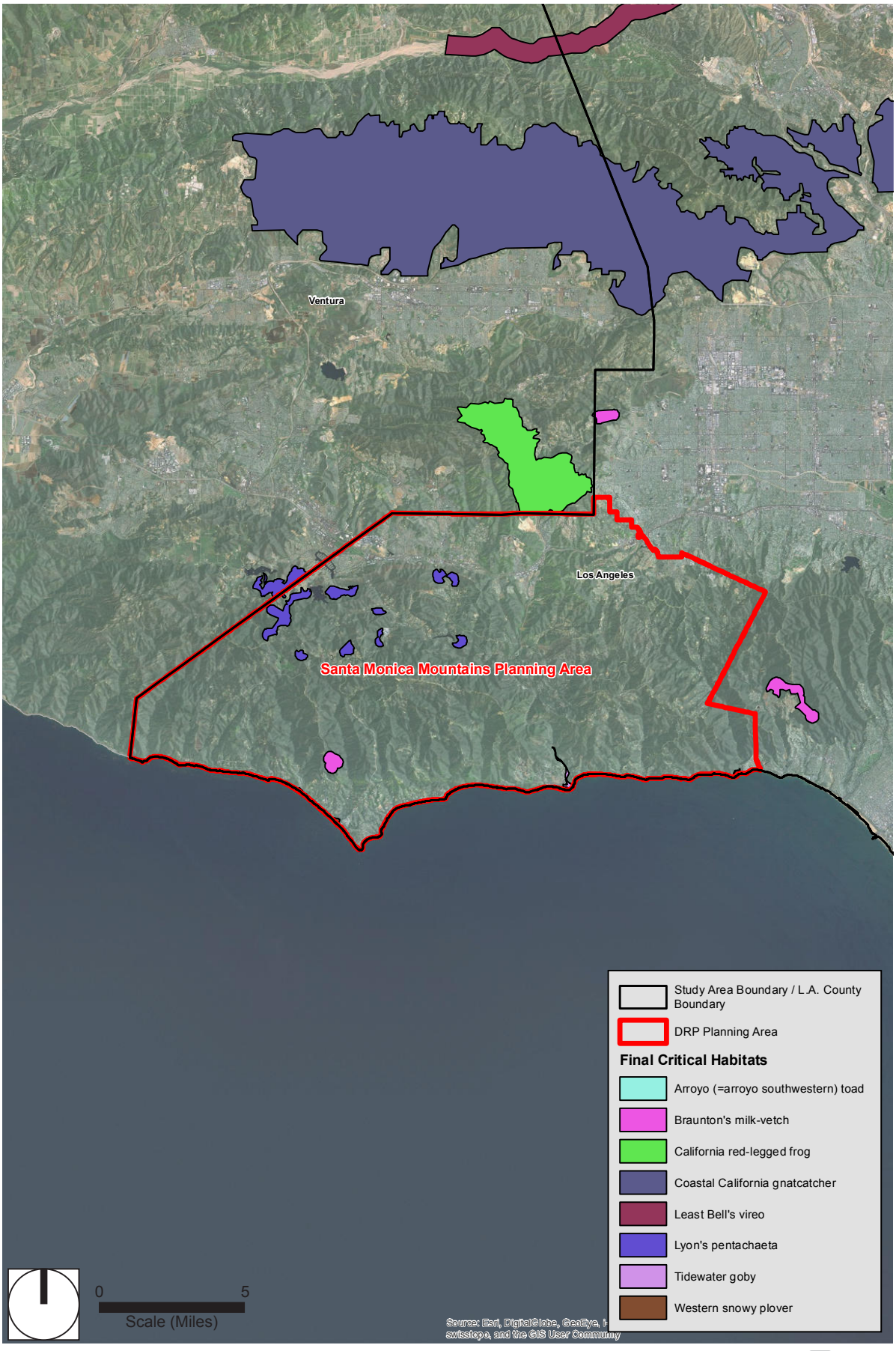

Los Angeles
Coastal Islands Planning Area
Coastal Islands Planning Area
Los Angeles
0
7
Scale (Miles)
Study Area Boundary / L.A. County Boundary
DRP Planning

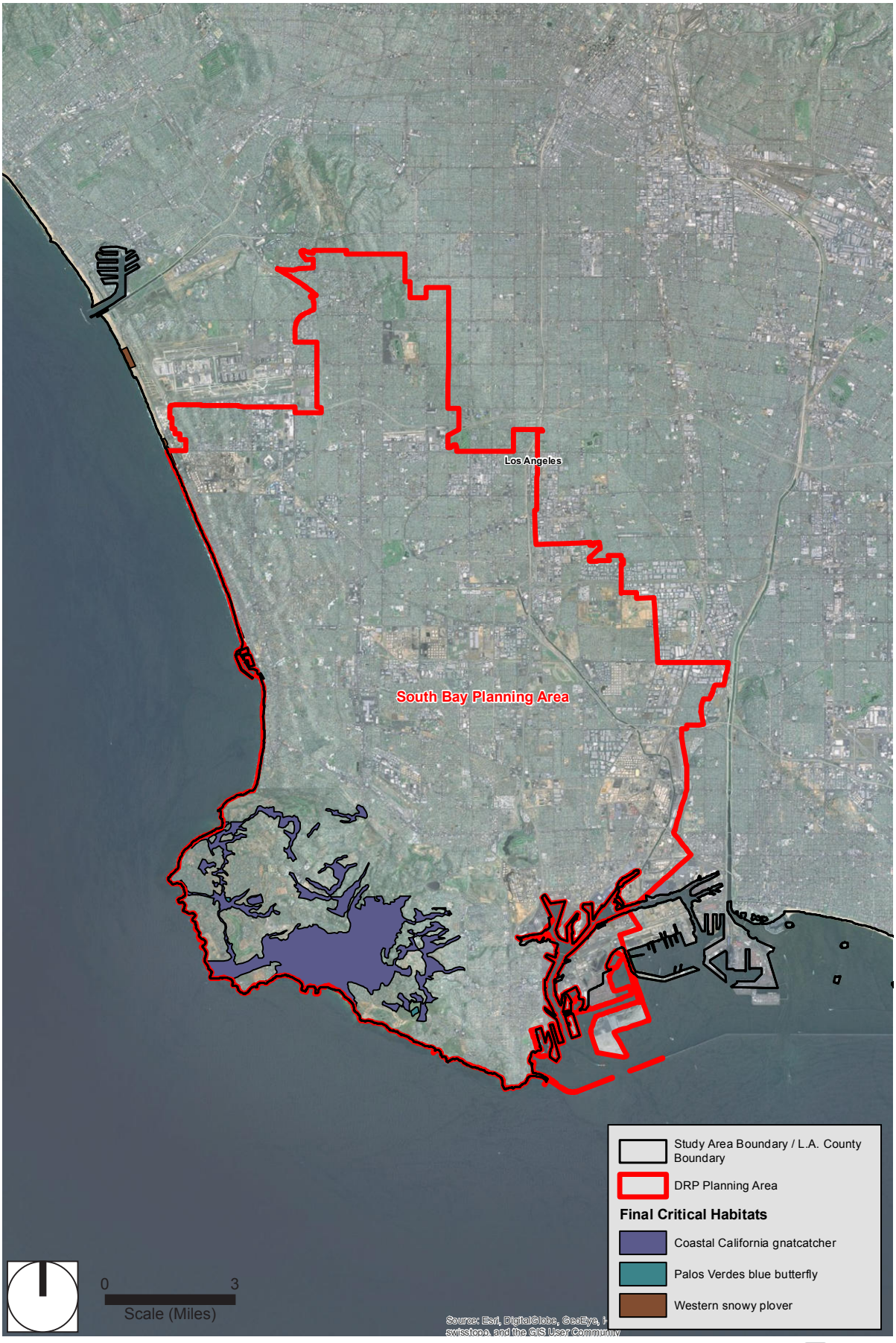

Gateway Planning Area
Los Angeles
Gateway Planning Area
Orange
Study Area Boundary / L.A. County Boundary
DRP Planning Area
Final Critical Habitats
Coastal California gnatcatcher
0
3
Scale (Miles)
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

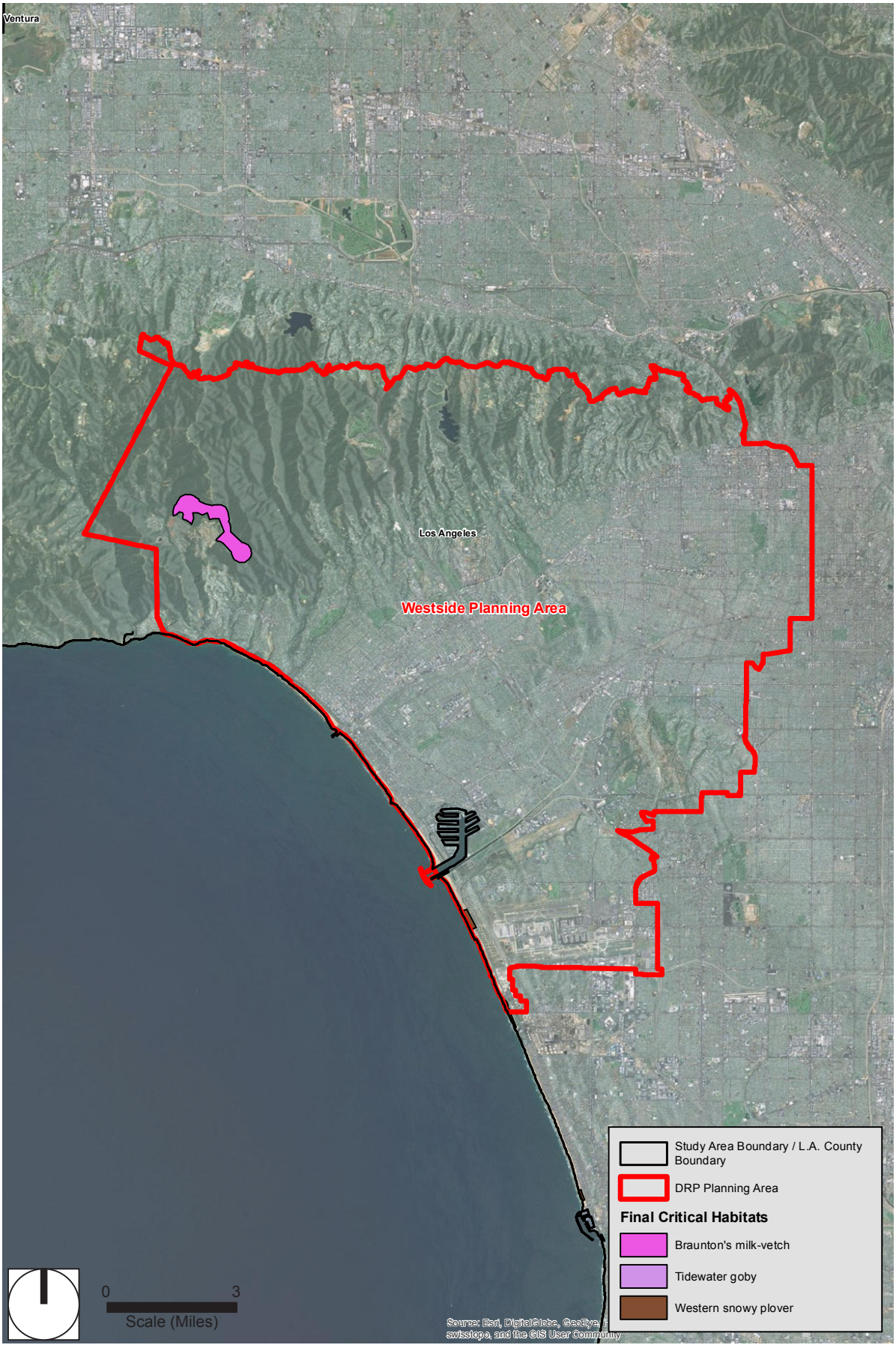

Metro Planning Area
Los Angeles
Study Area Boundary / L.A. County Boundary
DRP Planning Area
Final Critical Habitats
Coastal California gnatcatcher
Western snowy plover
0
3
Scale (Miles)


Ventura
Los Angeles
San Fernando Valley Planning Area
Study Area Boundary / L.A. County Boundary
DRP Planning Area
Final Critical Habitats
Arroyo (=arroyo southwestern) toad
Braunton's milk-vetch
California red-legged frog
Coastal California gnatcatcher
Least Bell's vireo
Santa Ana sucker
Spreading navarretia
Tidewater goby
Western snowy plover
0
5
Scale (Miles)
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


Study Area Boundary / L.A. County Boundary
DRP Planning
Final Critical Habitats
Arroyo (=arroyo southwestern) toad
Braunton's milk-vetch
California condor
California red-legged frog
Coastal California gnatcatcher
Least Bell's vireo
Lyon's pentachaeta
Santa Ana
Spreading navarretia
Kern
Santa Clarita Valley Planning Area
Los Angeles
Ventura
0
6
Scale (Miles)
Source: Esri, DigitalGlobe, GeoEye, Foubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

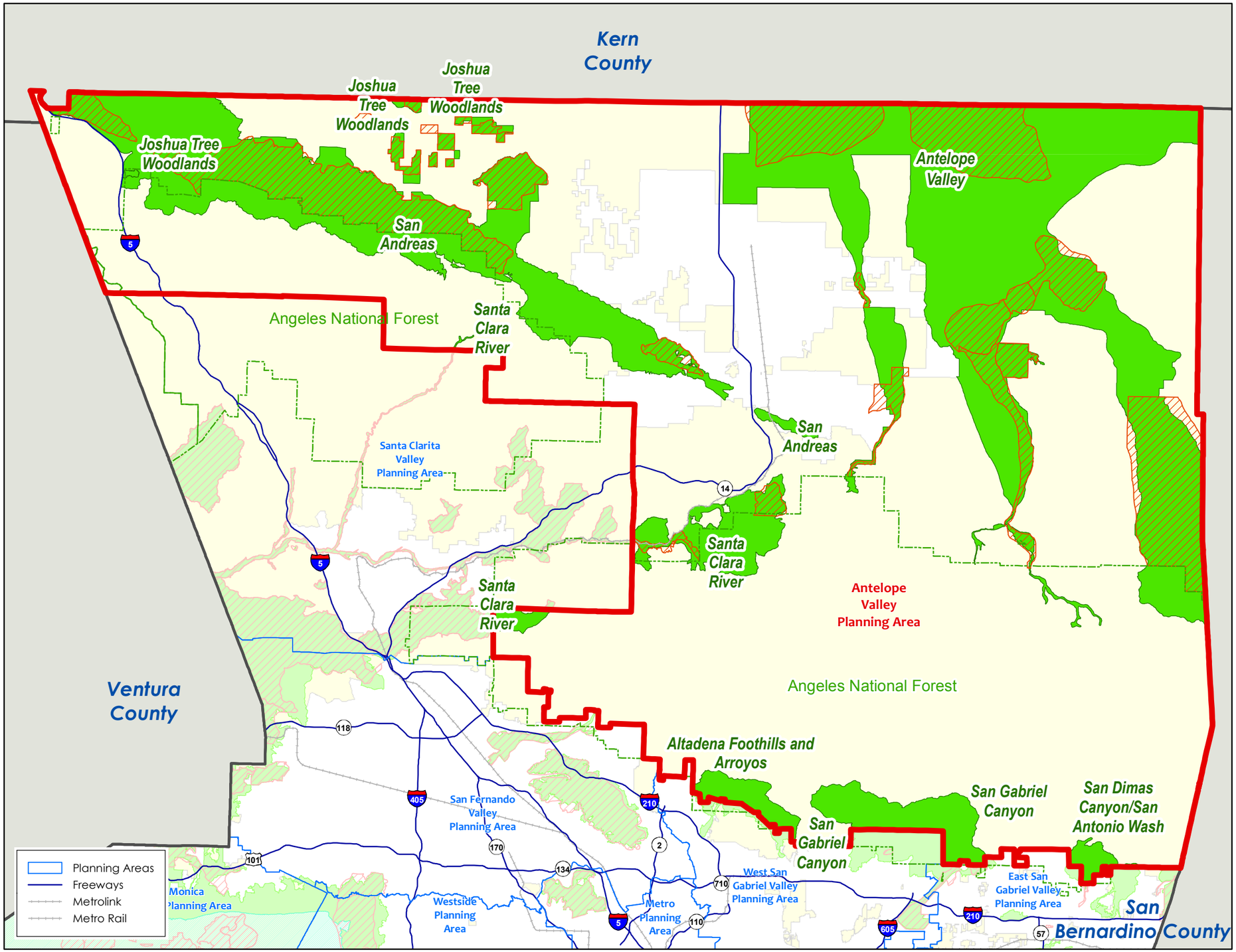

Ventura
Los Angeles
Santa Monica Mountains Planning Area
Study Area Boundary / L.A. County Boundary
DRP Planning Area
Final Critical Habitats
Arroyo (=arroyo southwestern) toad
Braunton's milk-vetch
California red-legged frog
Coastal California gnatcatcher
Least Bell's vireo
Lyon's pentachaeta
Tidewater goby
Western snowy plover
0
5
Scale (Miles)
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


Los Angeles
South Bay Planning Area
Study Area Boundary / L.A. County Boundary
DRP Planning Area
Final Critical Habitats
Coastal California gnatcatcher
Palos Verdes blue butterfly
Western snowy plover
0
3
Scale (Miles)

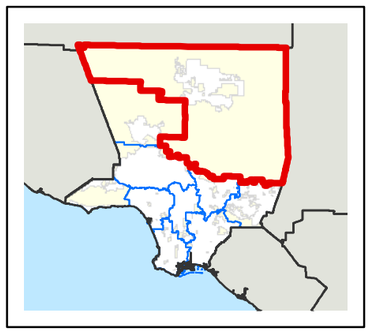

Ventura
Los Angeles
Westside Planning Area
Study Area Boundary / L.A. County Boundary
DRP Planning Area
Final Critical Habitats
Braunton's milk-vetch
Tidewater goby
Western snowy plover
0
3
Scale (Miles)
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

EXISTING AND PROPOSED SIGNIFICANT ECOLOGICAL AREAS (SEAs)

ANTELOPE VALLEY PLANNING AREA



- Significant Ecological Area - Proposed
- Coastal Resource Area - Proposed
- Significant Ecological Area - Existing



LOS ANGELES COUNTY GENERAL PLAN UPDATE
EIR

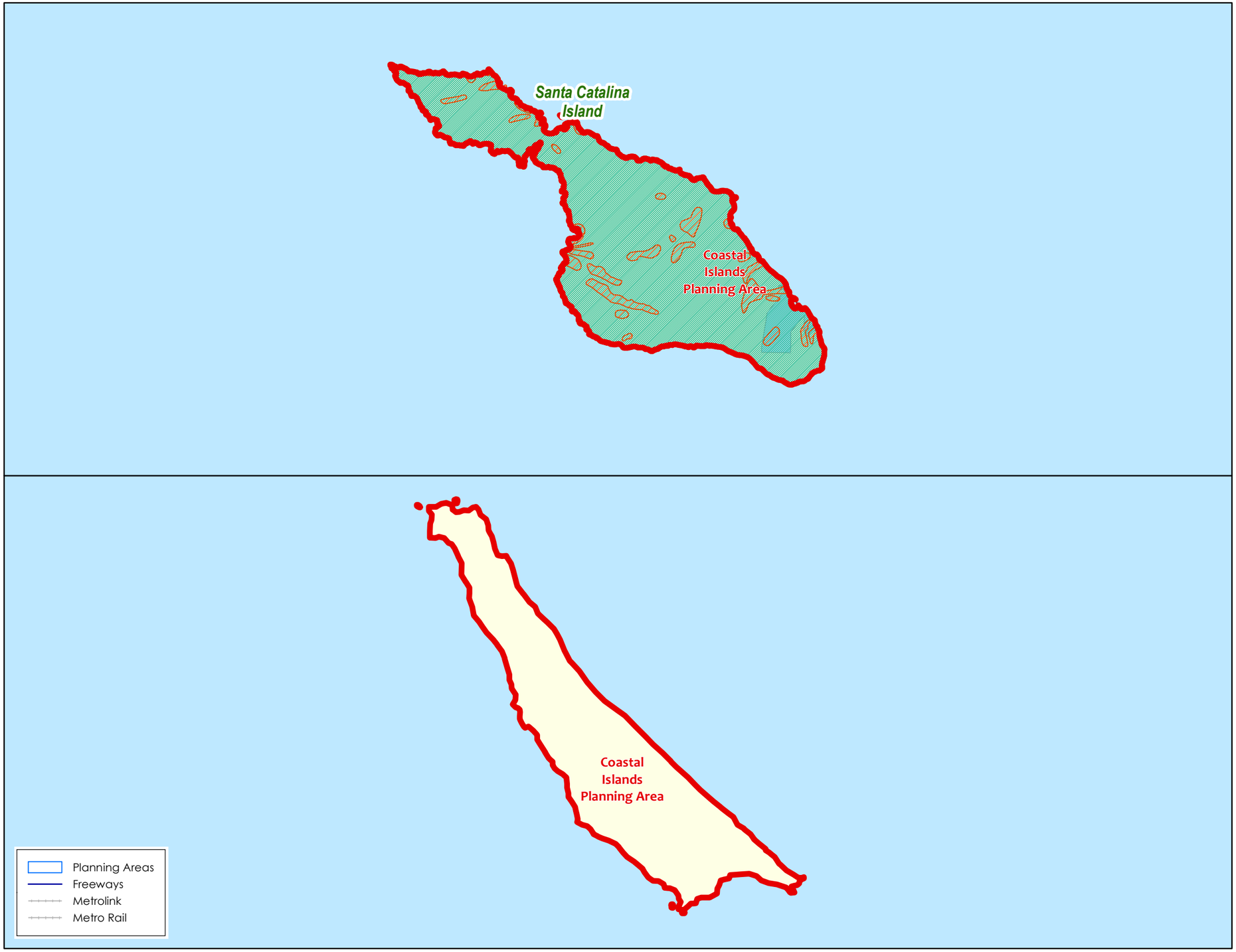
COLA-03.0E 6/3/2014 12:59:10 PM
0 3 6 Miles

PLACEWORKS

Source: Department of Regional Planning, 2014

EXISTING AND PROPOSED SIGNIFICANT ECOLOGICAL AREAS (SEAs)

COASTAL ISLANDS PLANNING AREA



- Significant Ecological Area - Proposed
- Coastal Resource Area - Proposed
- Significant Ecological Area - Existing



LOS ANGELES COUNTY
GENERAL PLAN UPDATE
EIR

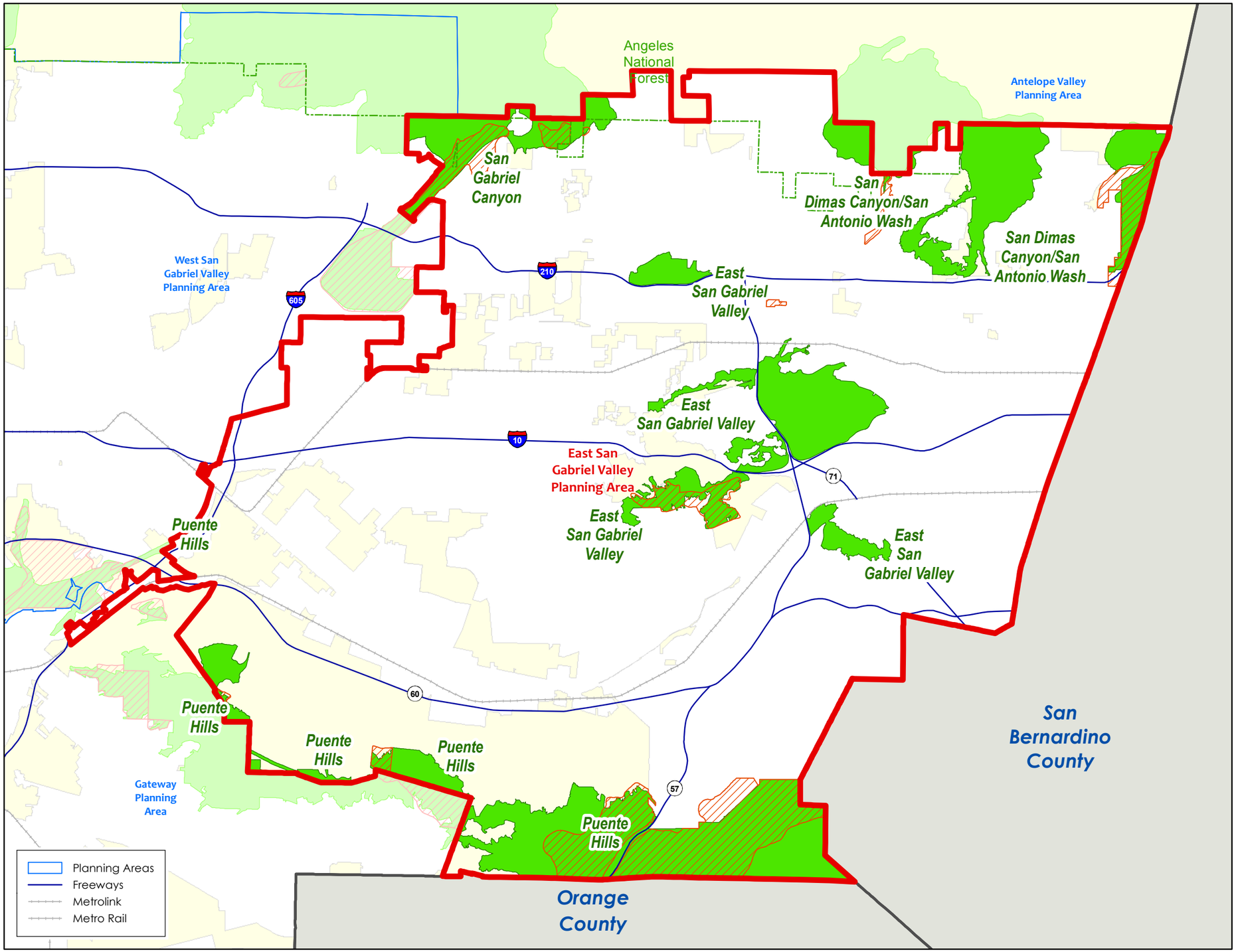
COLA-03.0E 6/3/2014 3:01:58 PM
0 2 4 Miles

PLACEWORKS

Source: Department of Regional Planning, 2014

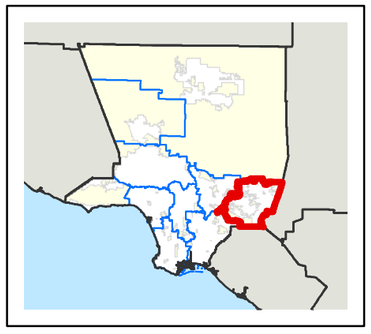
EXISTING AND PROPOSED SIGNIFICANT ECOLOGICAL AREAS (SEAs)

EAST SAN GABRIEL VALLEY PLANNING AREA



Source: Department of Regional Planning, 2014

- Significant Ecological Area - Proposed
- Coastal Resource Area - Proposed
- Significant Ecological Area - Existing



LOS ANGELES COUNTY GENERAL PLAN UPDATE **EIR**

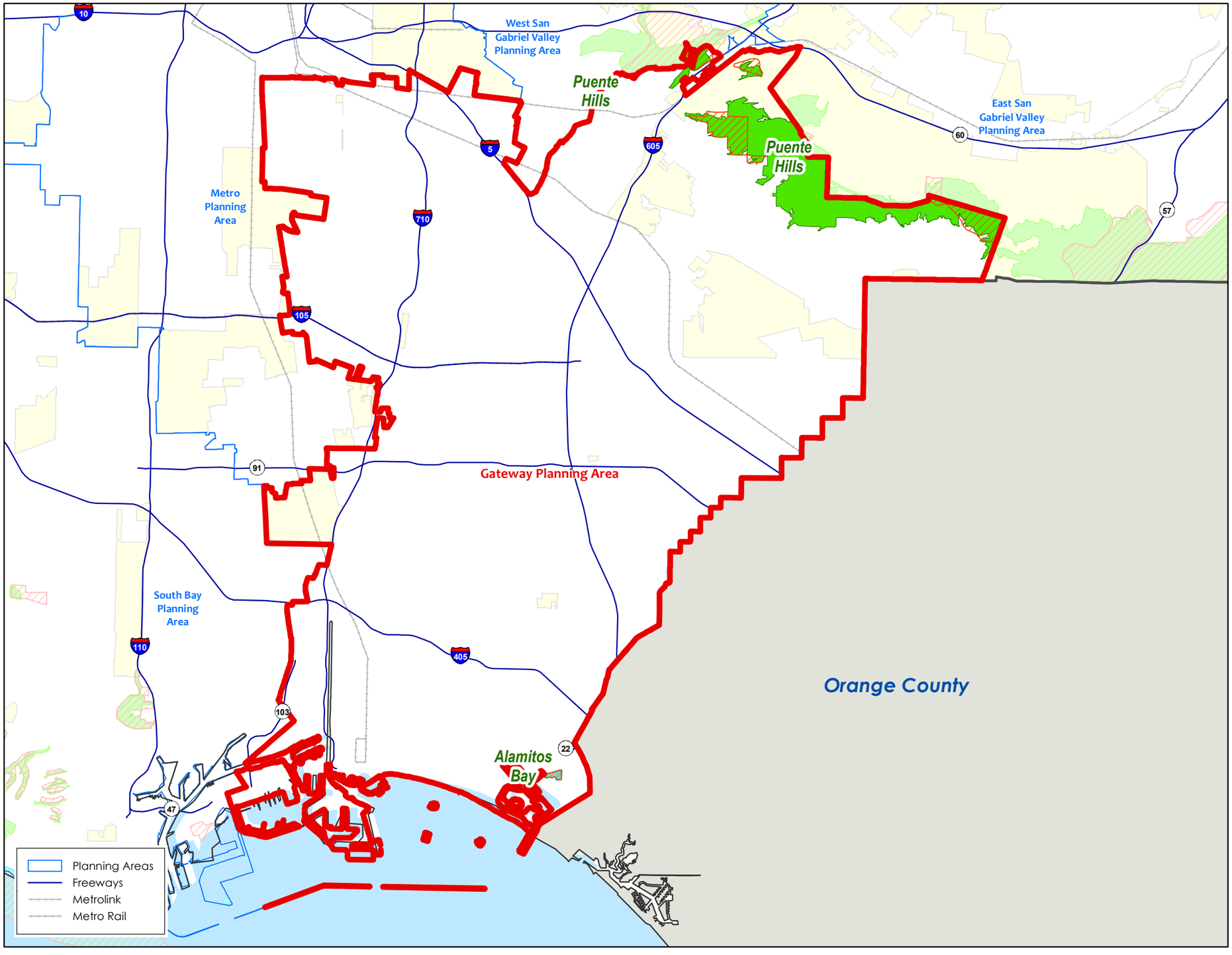
COLA-03.0E 6/3/2014 3:09:34 PM

0 1 2 Miles

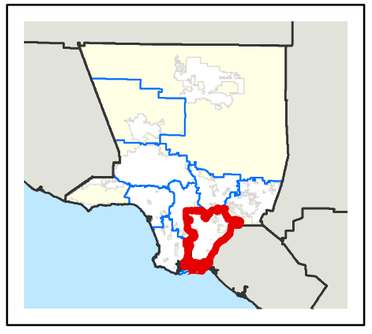
PLACEWORKS

EXISTING AND PROPOSED SIGNIFICANT ECOLOGICAL AREAS (SEAs)

GATEWAY PLANNING AREA



- Significant Ecological Area - Proposed
- Coastal Resource Area - Proposed
- Significant Ecological Area - Existing



LOS ANGELES COUNTY
GENERAL PLAN UPDATE
EIR

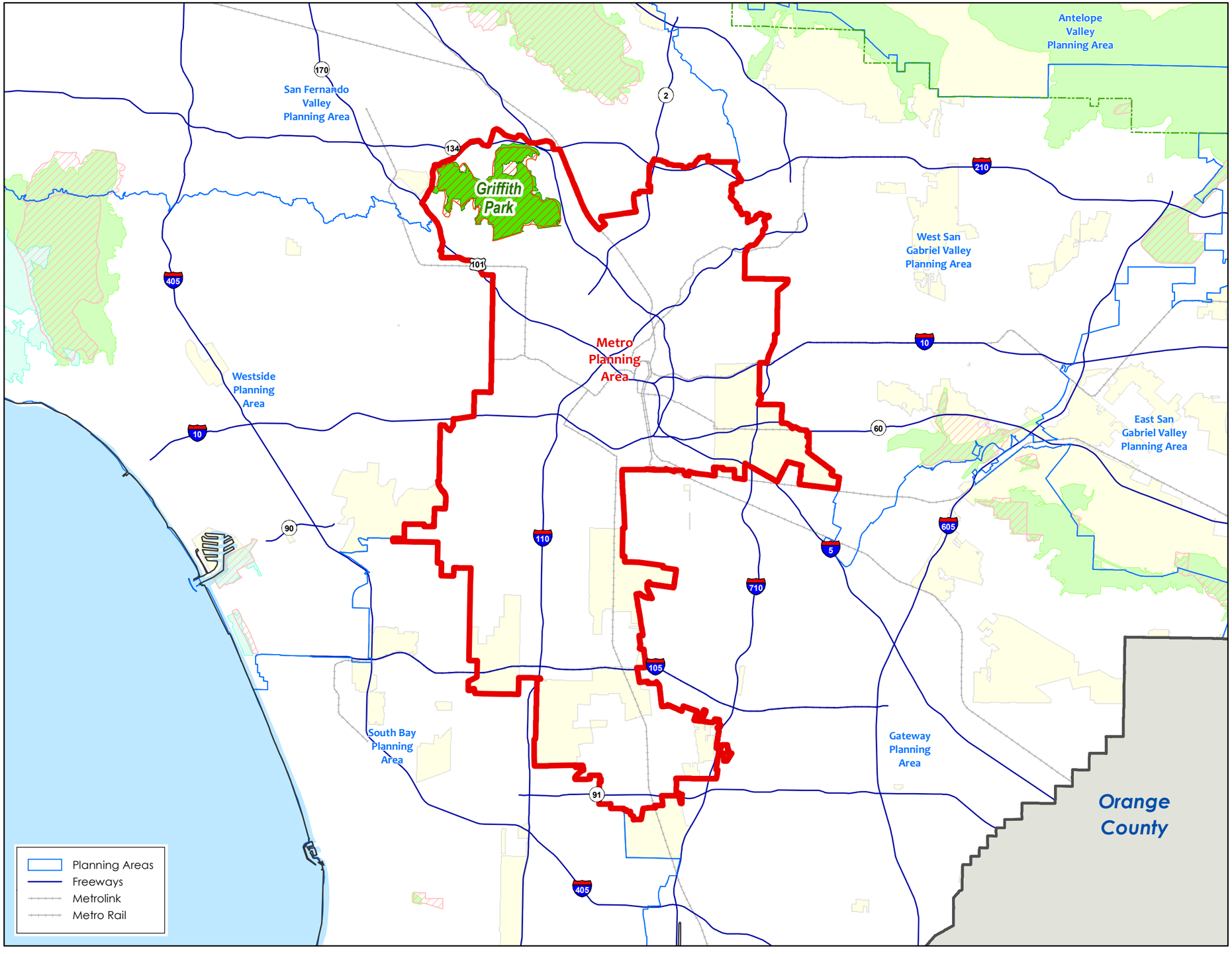
COLA-03.0E 6/3/2014 1:30:06 PM
0 1.25 2.5 Miles

PLACEWORKS

Source: Department of Regional Planning, 2014

EXISTING AND PROPOSED SIGNIFICANT ECOLOGICAL AREAS (SEAs)

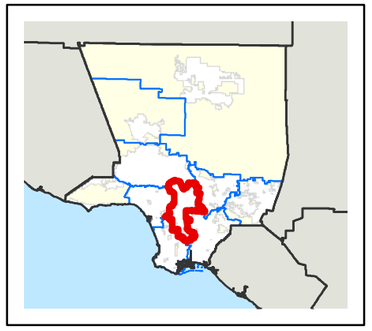
METRO PLANNING AREA



Significant Ecological Area - Proposed

Coastal Resource Area - Proposed

Significant Ecological Area - Existing



LOS ANGELES COUNTY GENERAL PLAN UPDATE **EIR**

COLA-03.0E 5/29/2014 5:11:08 PM

0 1.5 3 Miles

PLACEWORKS

Source: Department of Regional Planning, 2014

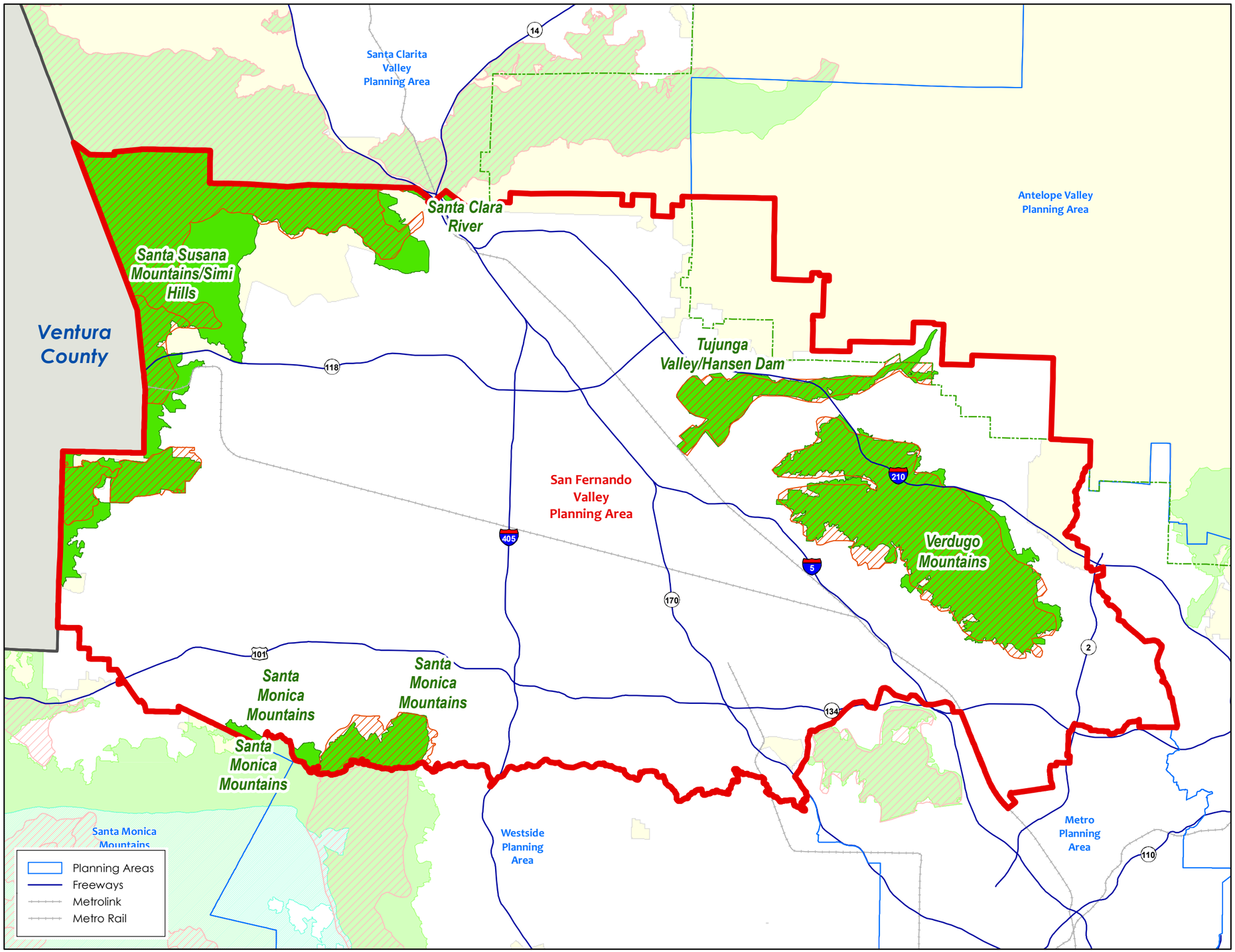
EXISTING AND PROPOSED SIGNIFICANT ECOLOGICAL AREAS (SEAs)

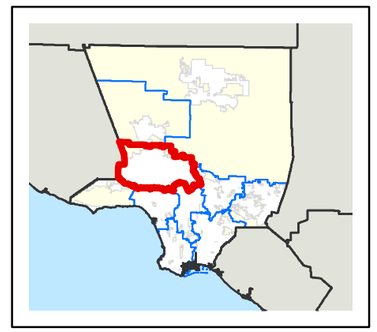
SAN FERNANDO VALLEY PLANNING AREA

Significant Ecological Area - Proposed

Coastal Resource Area - Proposed

Significant Ecological Area - Existing





LOS ANGELES COUNTY GENERAL PLAN UPDATE **EIR**

COLA-03.0E 6/3/2014 1:43:44 PM

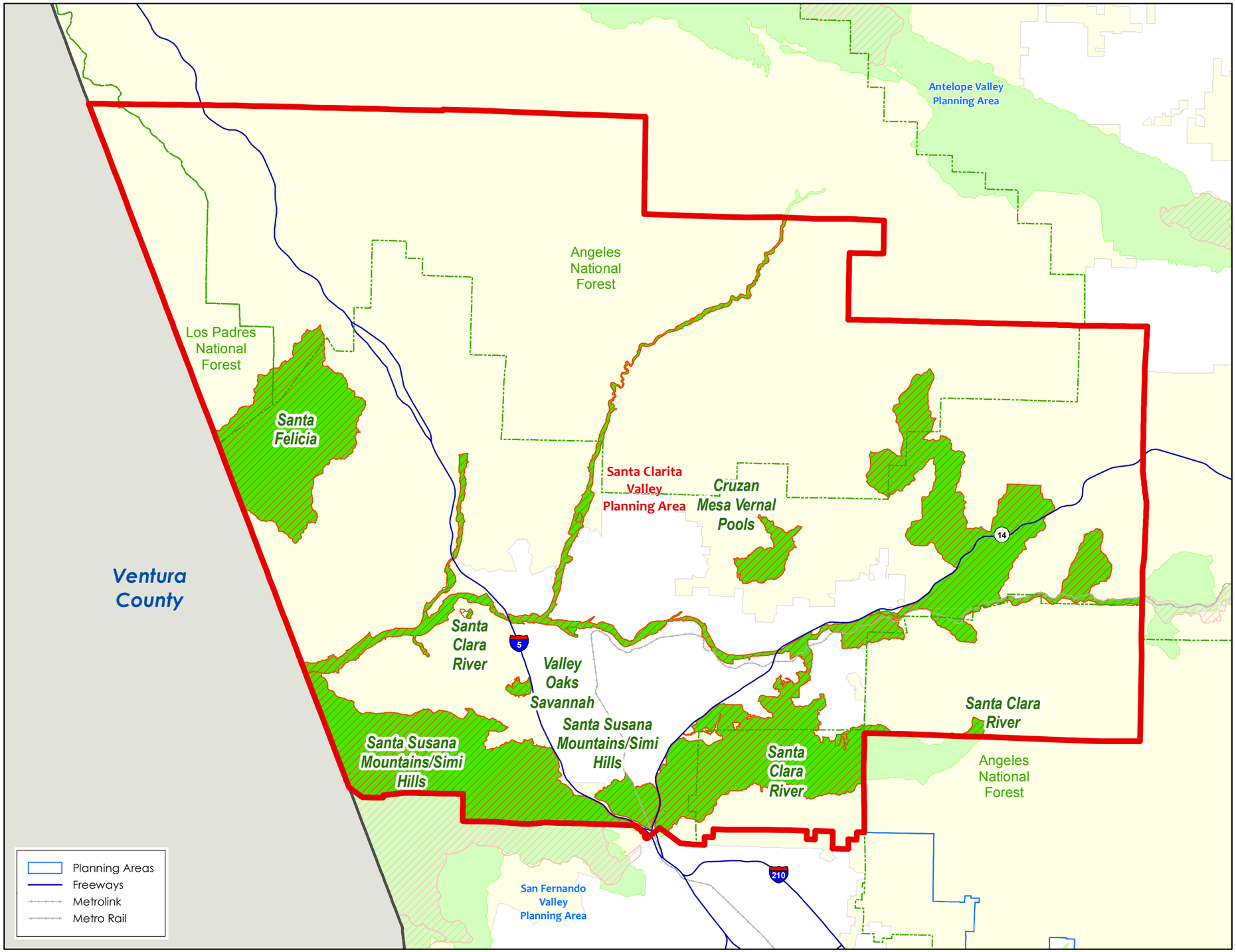
0 1.25 2.5 Miles

PLACEWORKS

Source: Department of Regional Planning, 2014

EXISTING AND PROPOSED SIGNIFICANT ECOLOGICAL AREAS (SEAs)

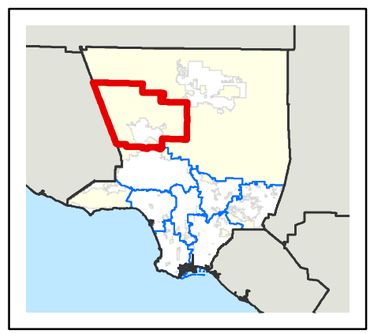
SANTA CLARITA VALLEY PLANNING AREA



Significant Ecological Area - Proposed

Coastal Resource Area - Proposed

Significant Ecological Area - Existing



LOS ANGELES COUNTY GENERAL PLAN UPDATE

EIR

COLA-03.0E 6/3/2014 1:49:45 PM

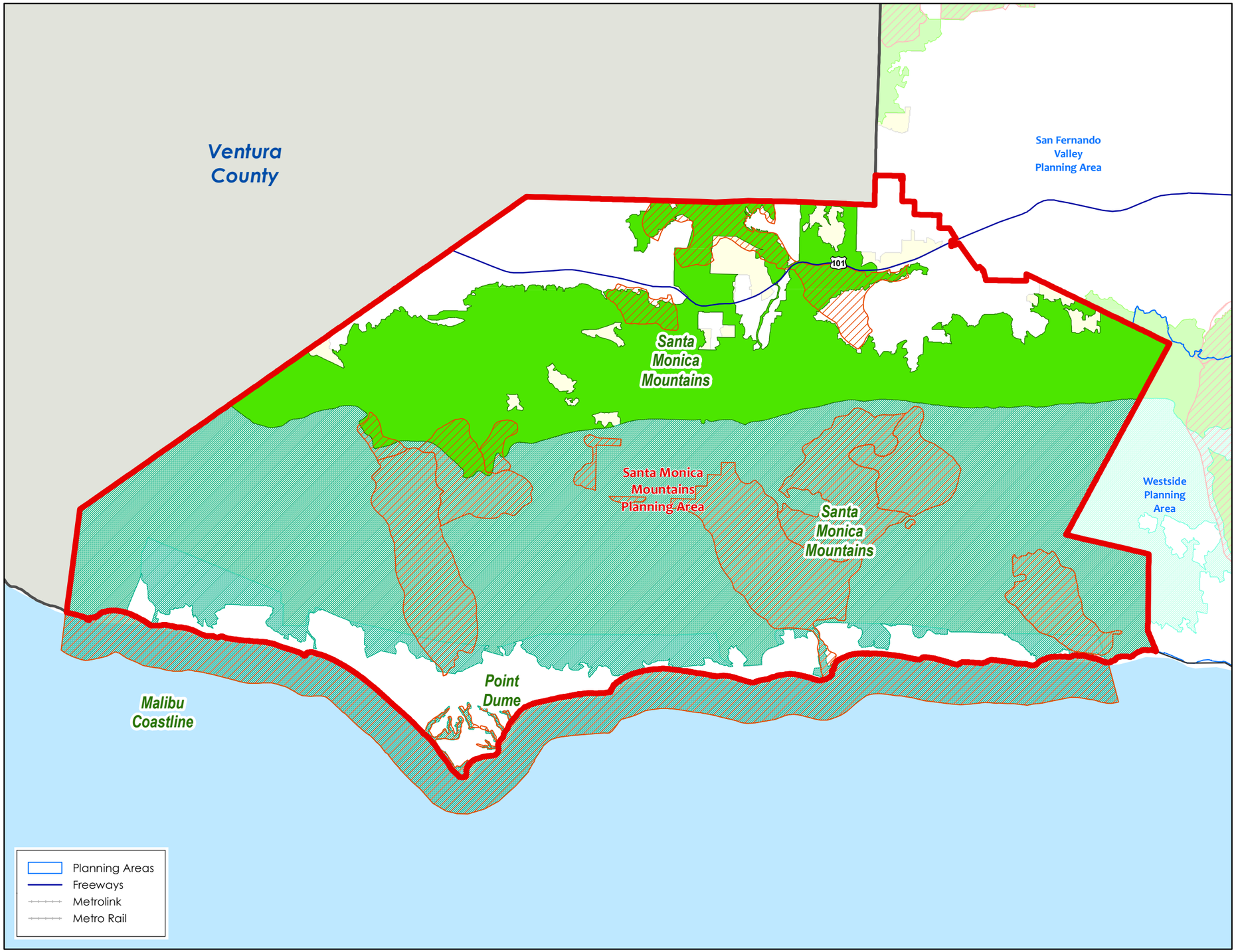
0 1.5 3 Miles

PLACEWORKS

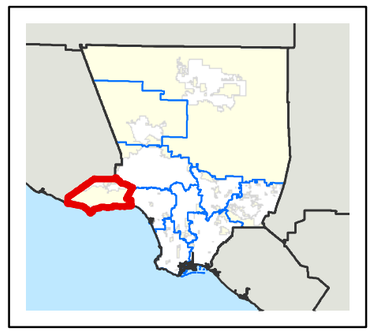
Source: Department of Regional Planning, 2014

EXISTING AND PROPOSED SIGNIFICANT ECOLOGICAL AREAS (SEAs)

SANTA MONICA MOUNTAINS PLANNING AREA



- Significant Ecological Area - Proposed
- Coastal Resource Area - Proposed
- Significant Ecological Area - Existing



LOS ANGELES COUNTY GENERAL PLAN UPDATE

EIR

COLA-03.0E 6/3/2014 2:16:07 PM

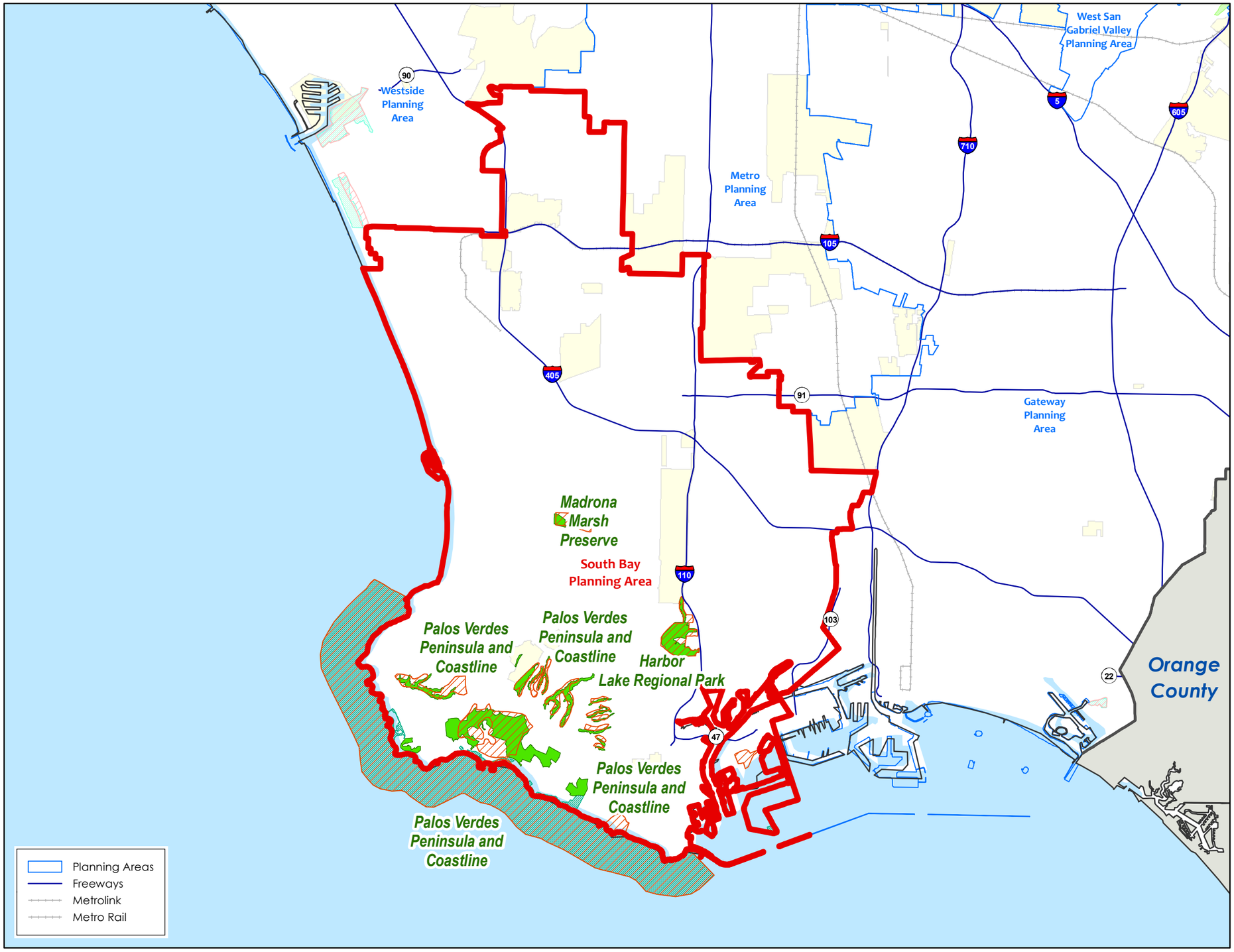
0 1 2 Miles

PLACEWORKS

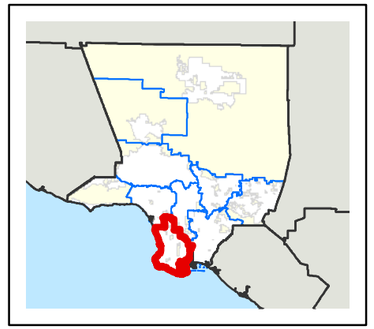
Source: Department of Regional Planning, 2014

EXISTING AND PROPOSED SIGNIFICANT ECOLOGICAL AREAS (SEAs)

SOUTH BAY PLANNING AREA



- Significant Ecological Area - Proposed
- Coastal Resource Area - Proposed
- Significant Ecological Area - Existing



LOS ANGELES COUNTY GENERAL PLAN UPDATE

EIR

COLA-03.0E 6/3/2014 2:21:53 PM

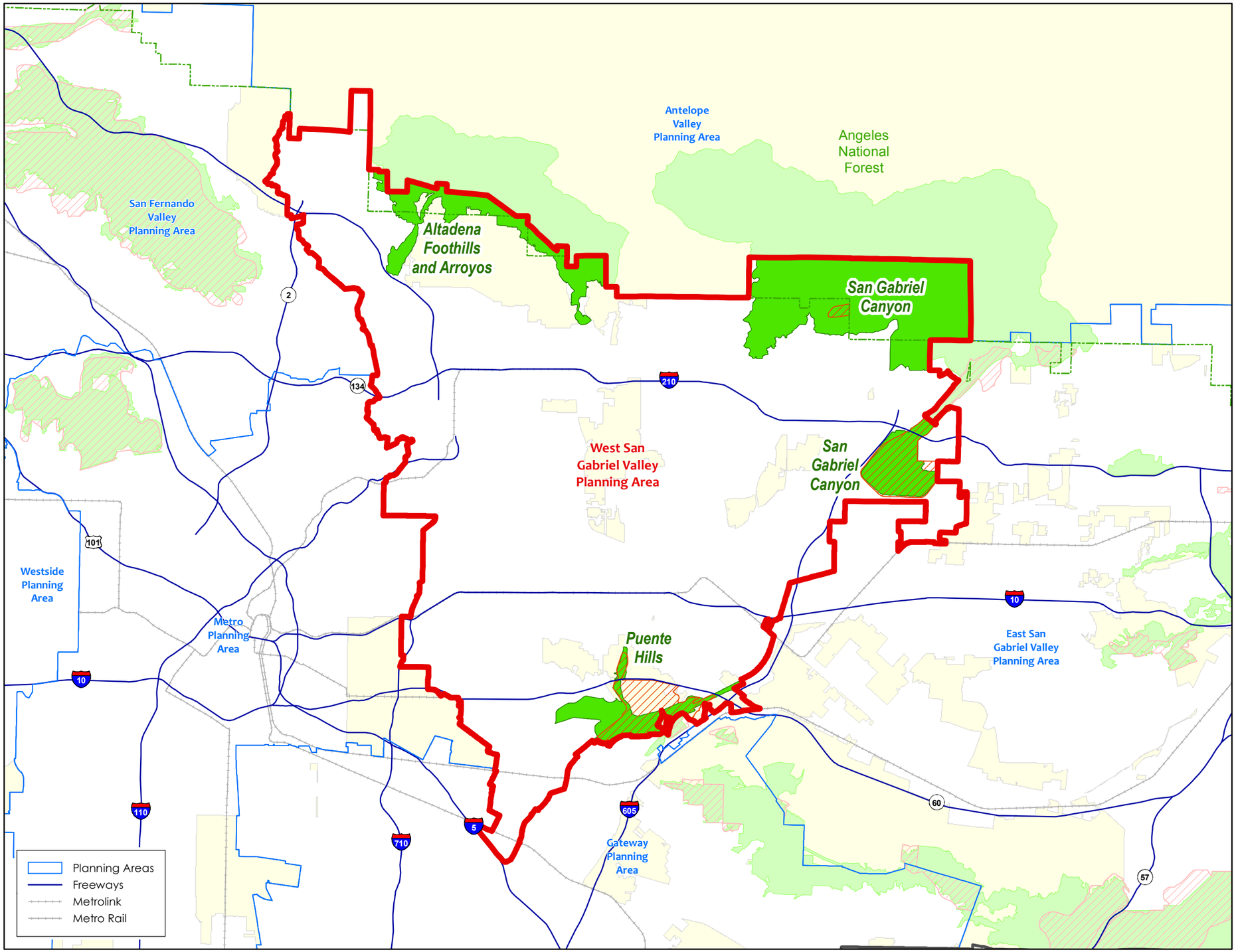
0 1.25 2.5 Miles

PLACEWORKS

Source: Department of Regional Planning, 2014

EXISTING AND PROPOSED SIGNIFICANT ECOLOGICAL AREAS (SEAs)

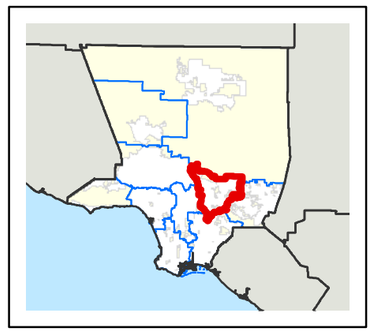
WEST SAN GABRIEL VALLEY PLANNING AREA



Significant Ecological Area - Proposed

Coastal Resource Area - Proposed

Significant Ecological Area - Existing



LOS ANGELES COUNTY GENERAL PLAN UPDATE **EIR**

COLA-03.0E 6/3/2014 3:16:20 PM

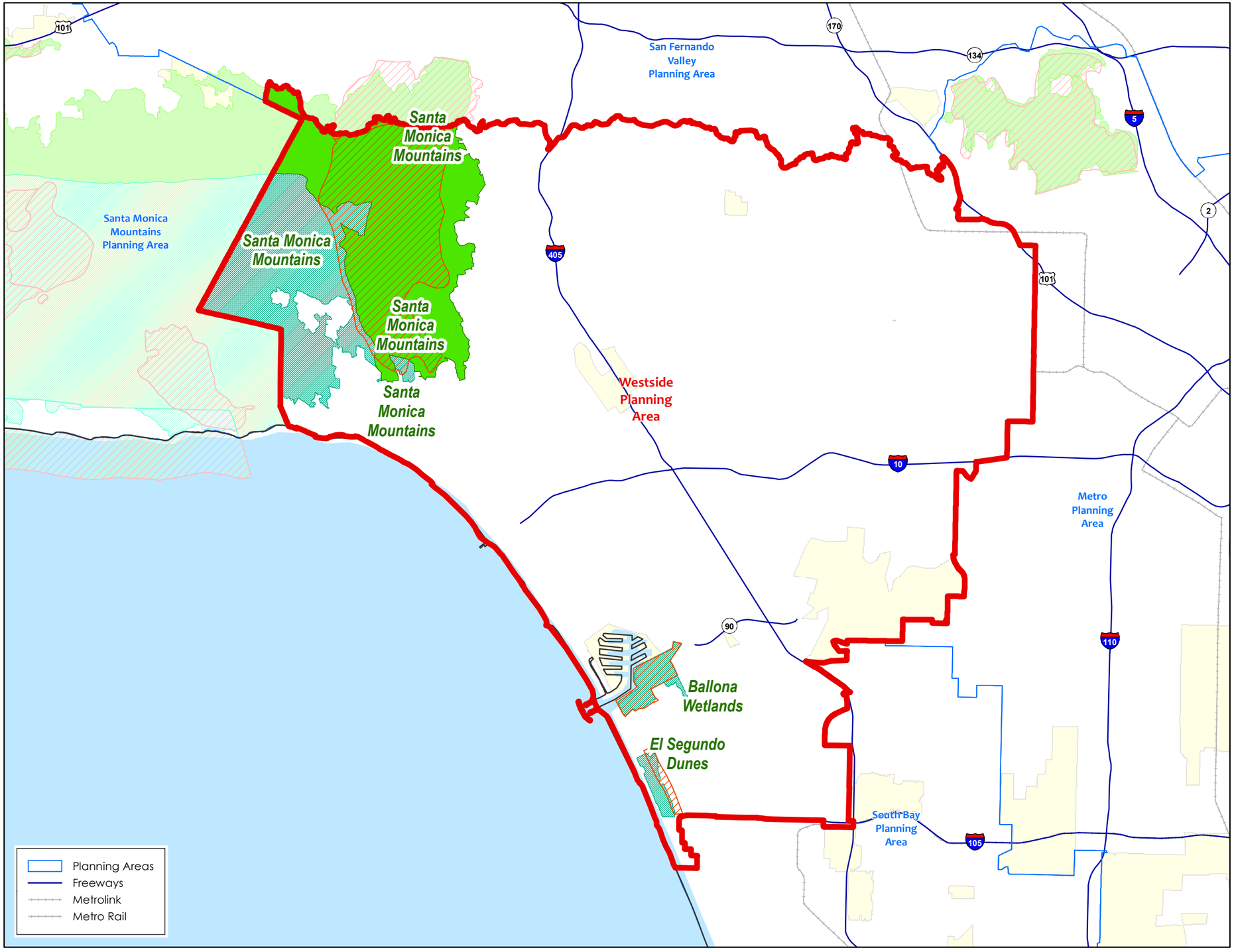
0 1.25 2.5 Miles

PLACEWORKS

Source: Department of Regional Planning, 2014

EXISTING AND PROPOSED SIGNIFICANT ECOLOGICAL AREAS (SEAs)

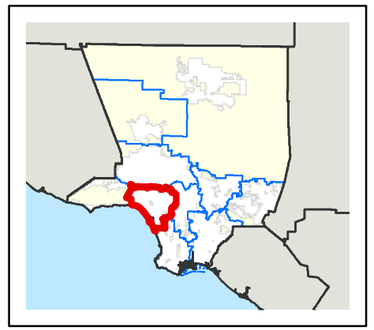
WESTSIDE PLANNING AREA



Significant Ecological Area - Proposed

Coastal Resource Area - Proposed

Significant Ecological Area - Existing



LOS ANGELES COUNTY GENERAL PLAN UPDATE

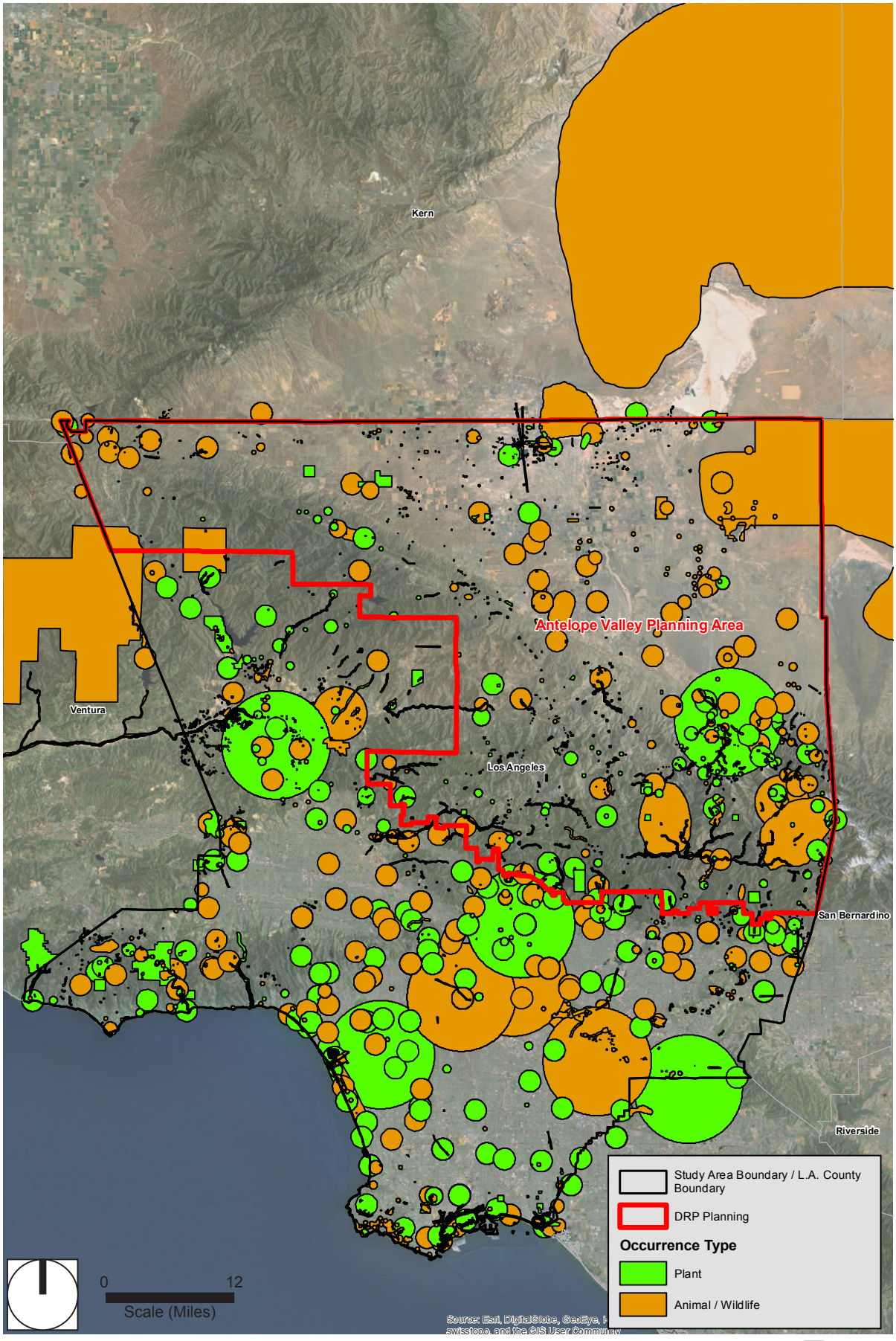
EIR

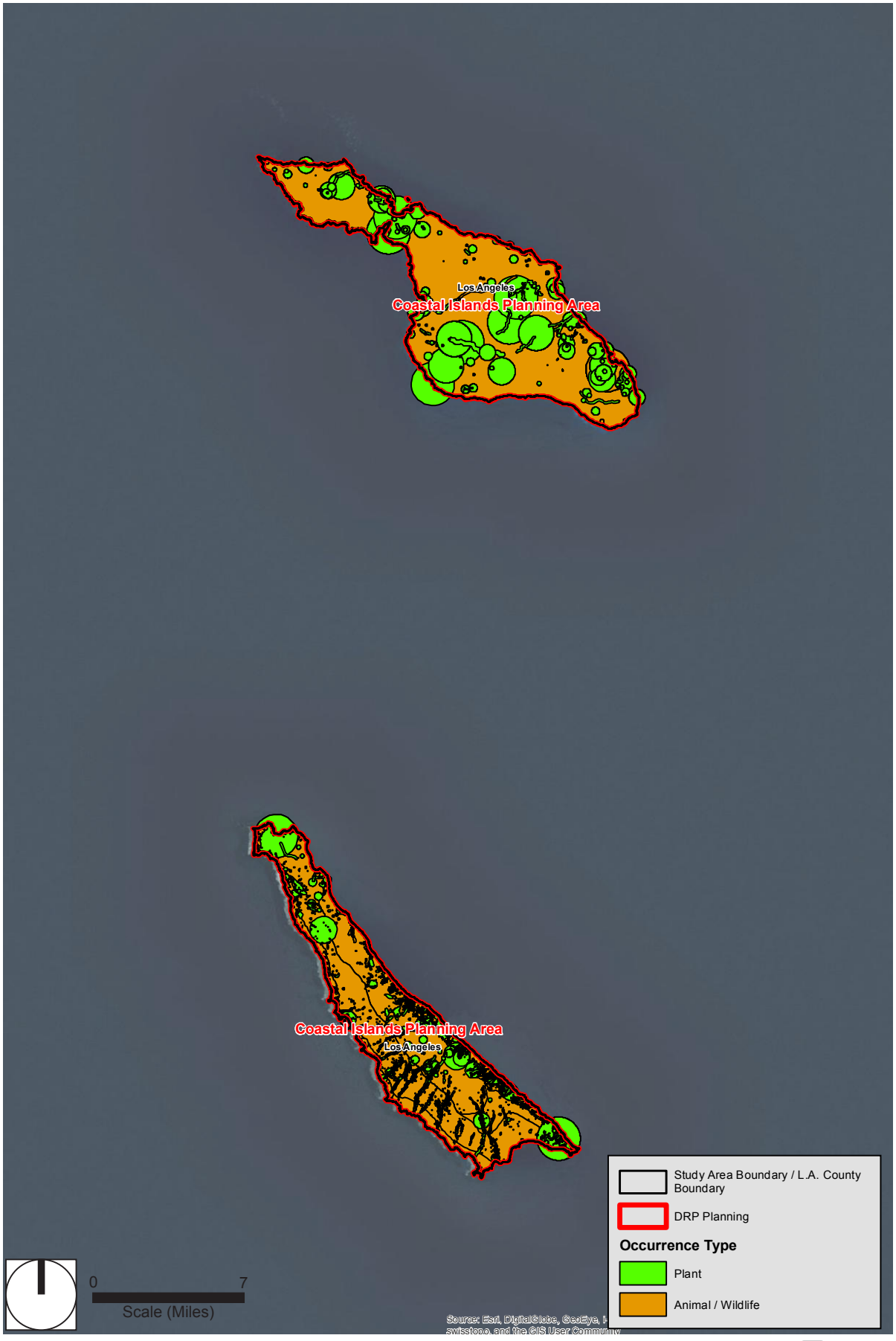
COLA-03.0E 6/3/2014 2:40:34 PM

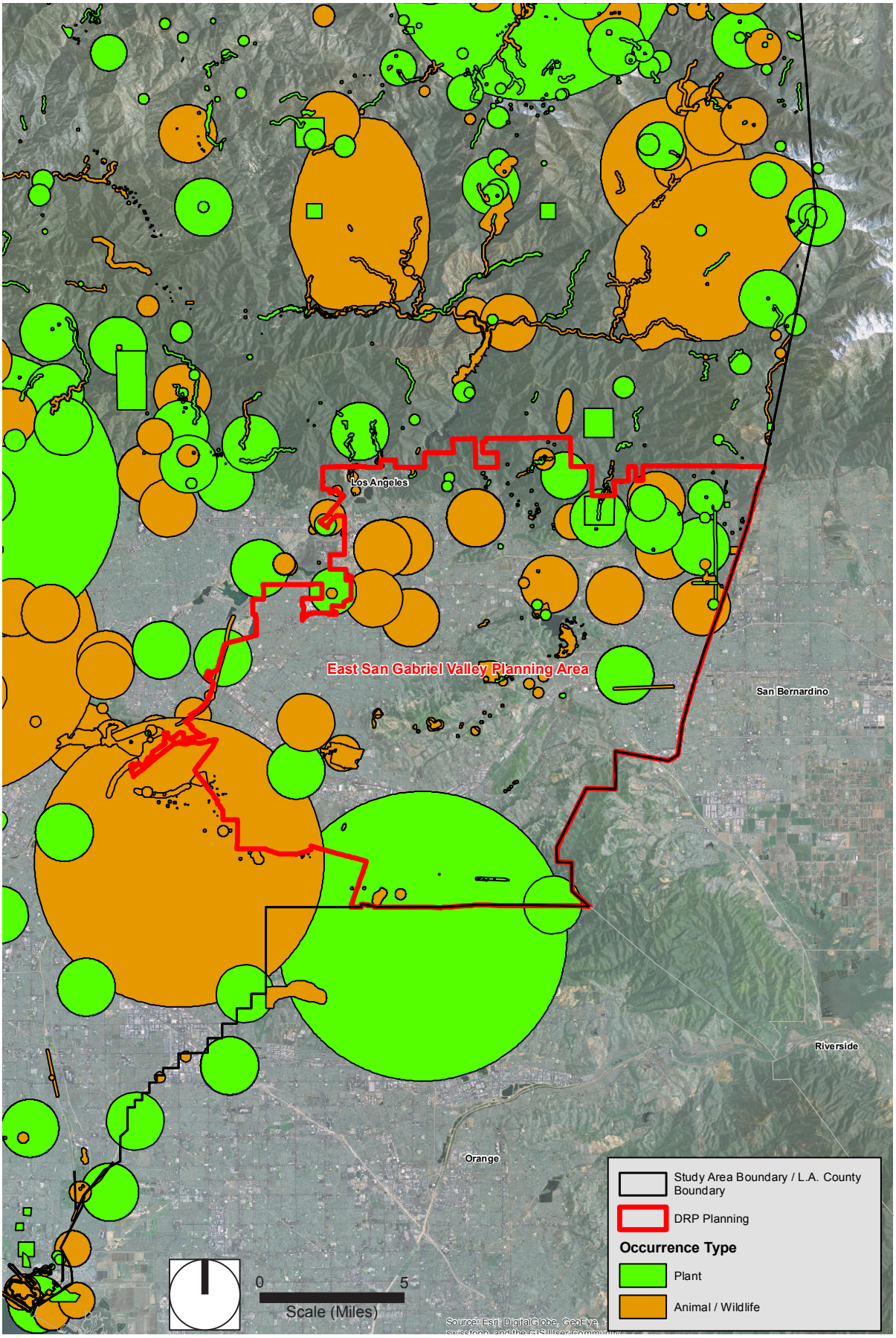
0 1 2 Miles

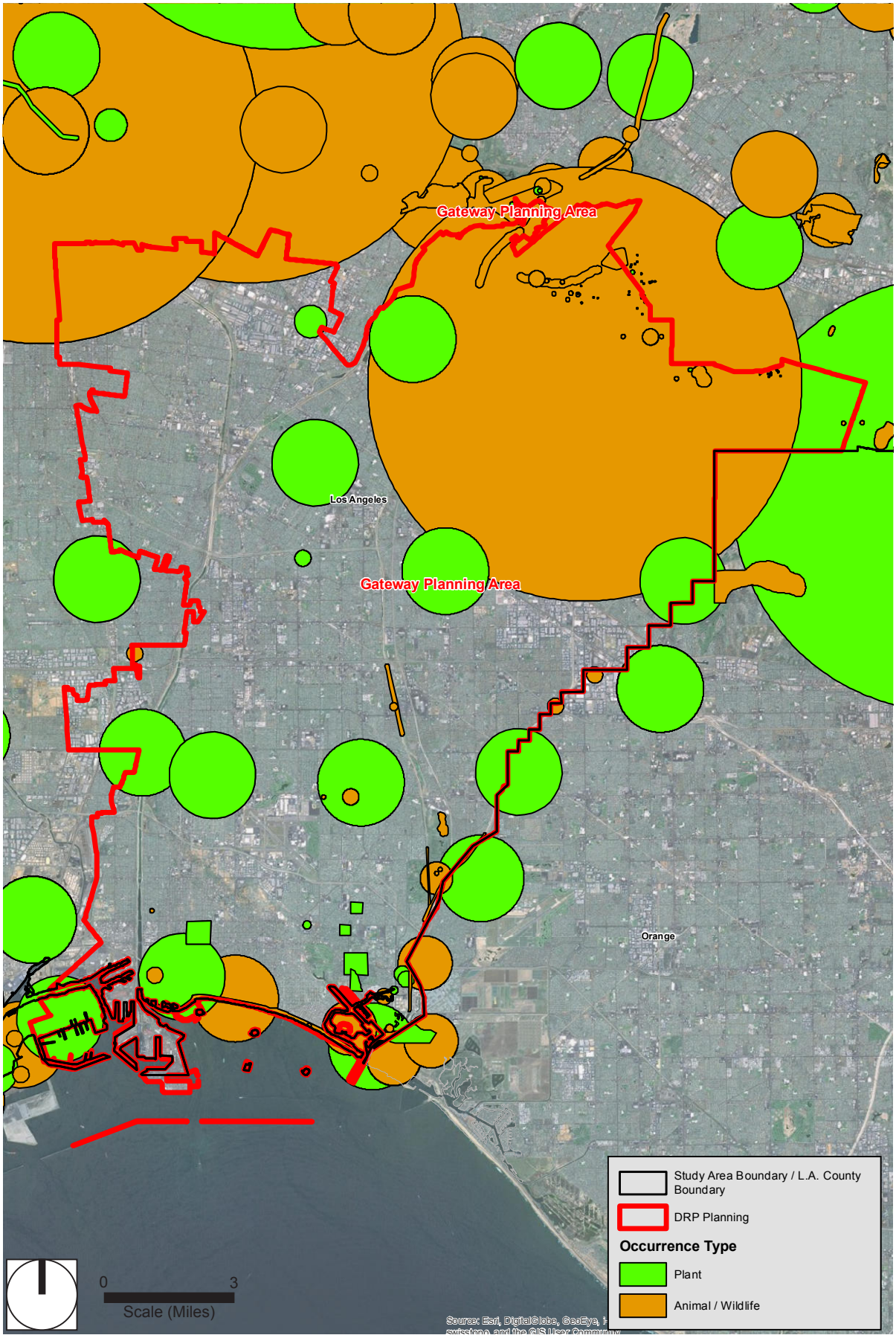
PLACEWORKS

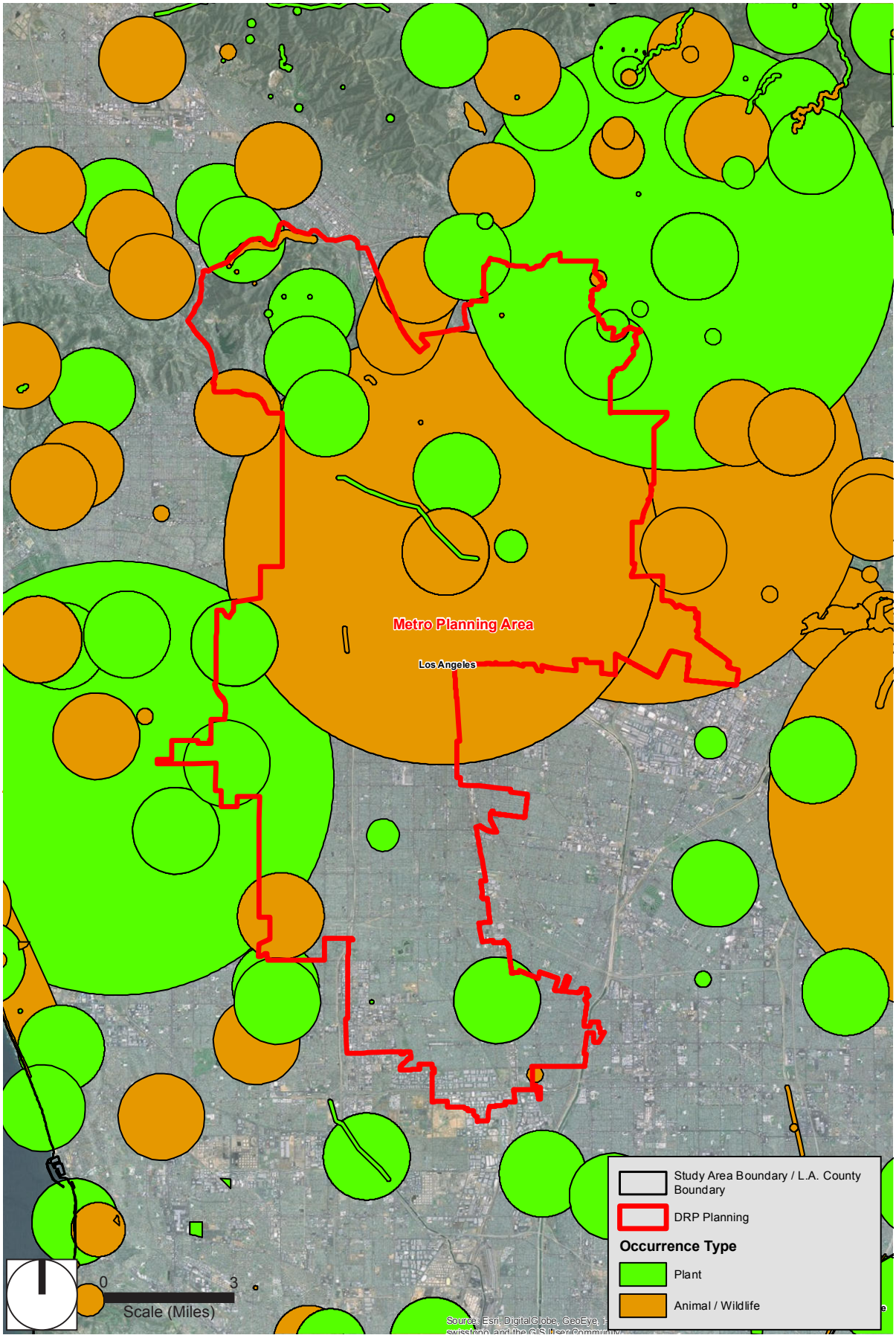
Source: Department of Regional Planning, 2014

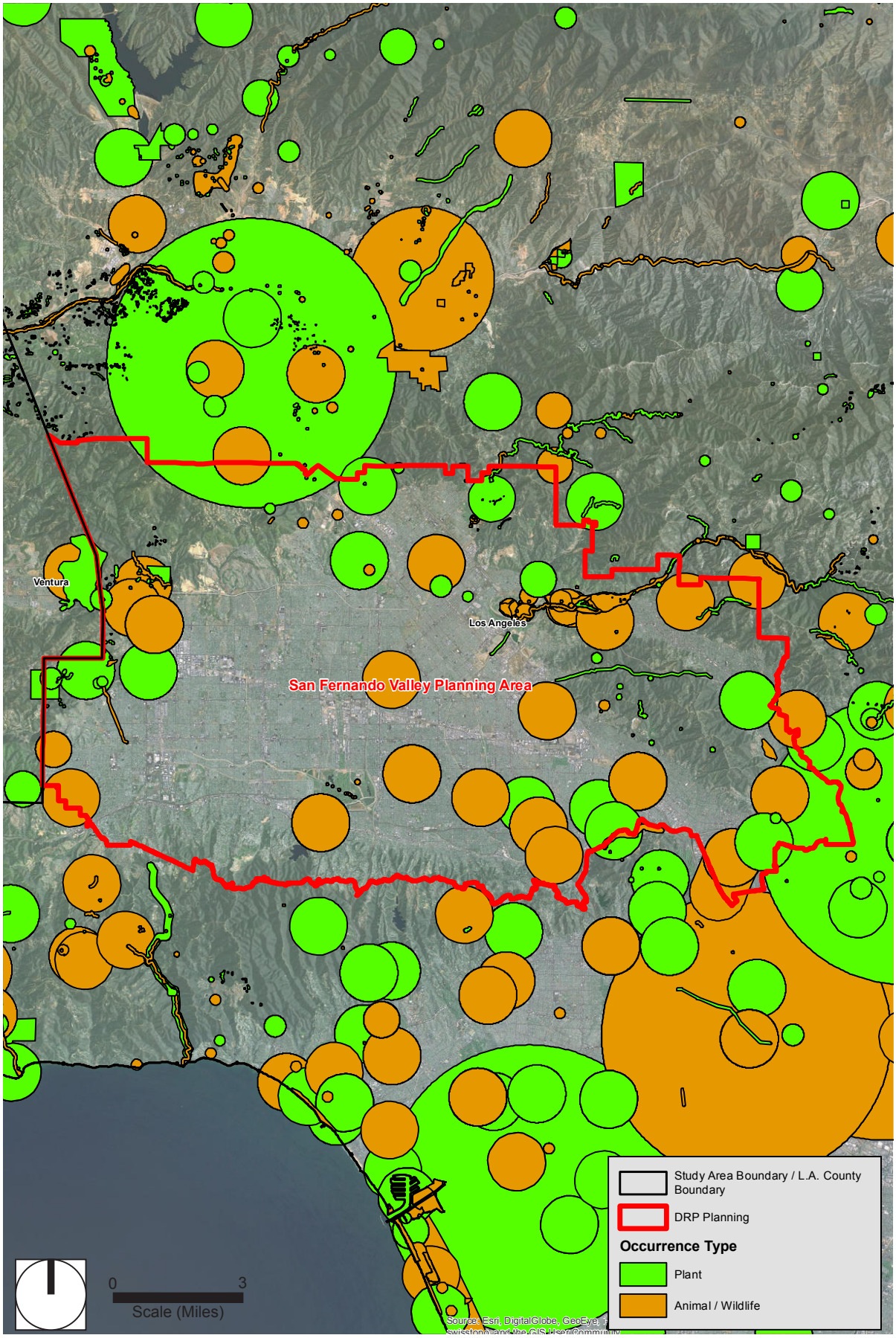

Kern
Antelope Valley Planning Area
Ventura
Los Angeles
San Bernardino
Riverside
Study Area Boundary / L.A. County Boundary
DRP Planning
Occurrence Type
Plant
Animal / Wildlife
0
12
Scale (Miles)

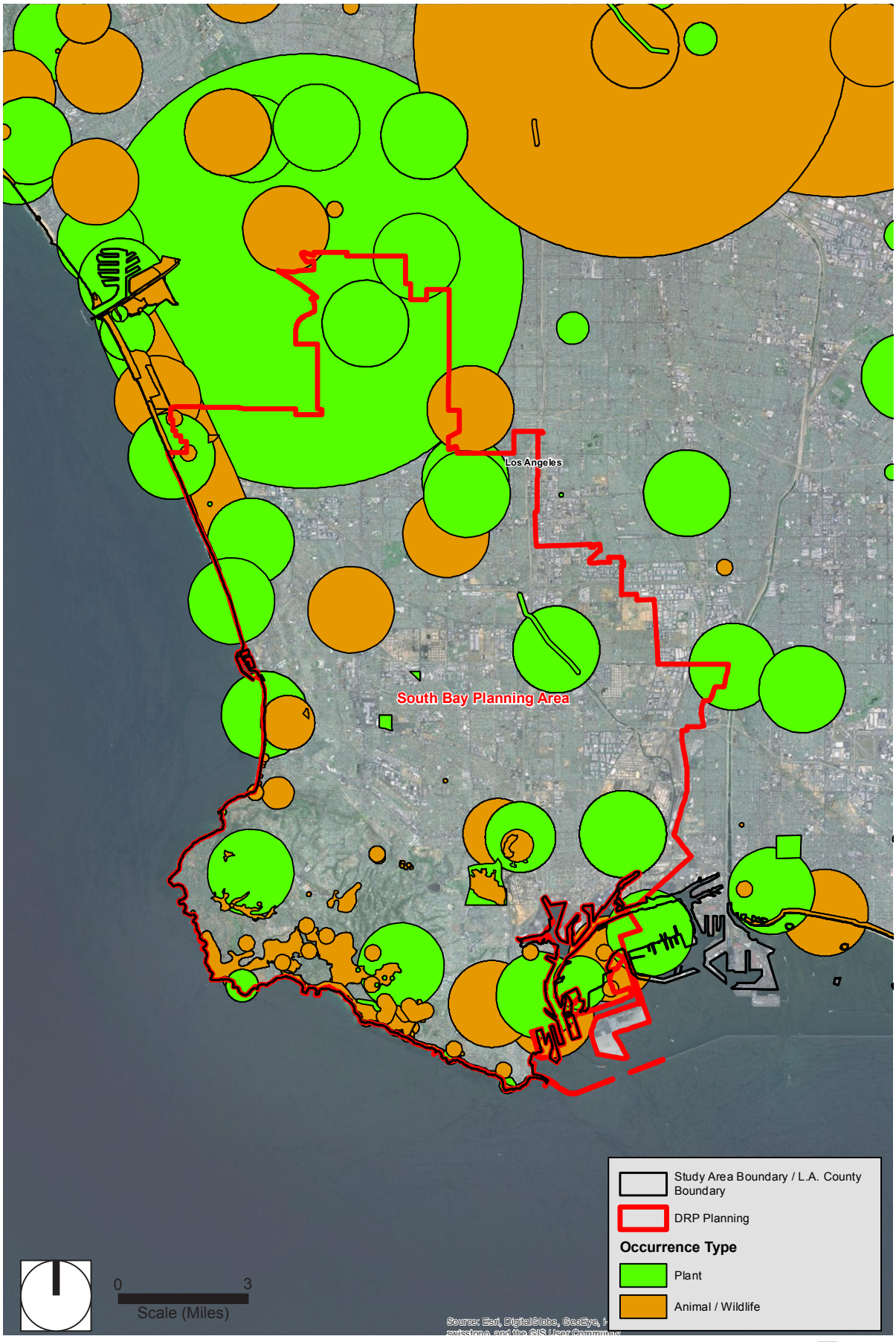

Los Angeles
Coastal Islands Planning Area
Coastal Islands Planning Area
Los Angeles
Study Area Boundary / L.A. County Boundary
DRP Planning
Occurrence Type
Plant
Animal / Wildlife
0
7
Scale (Miles)

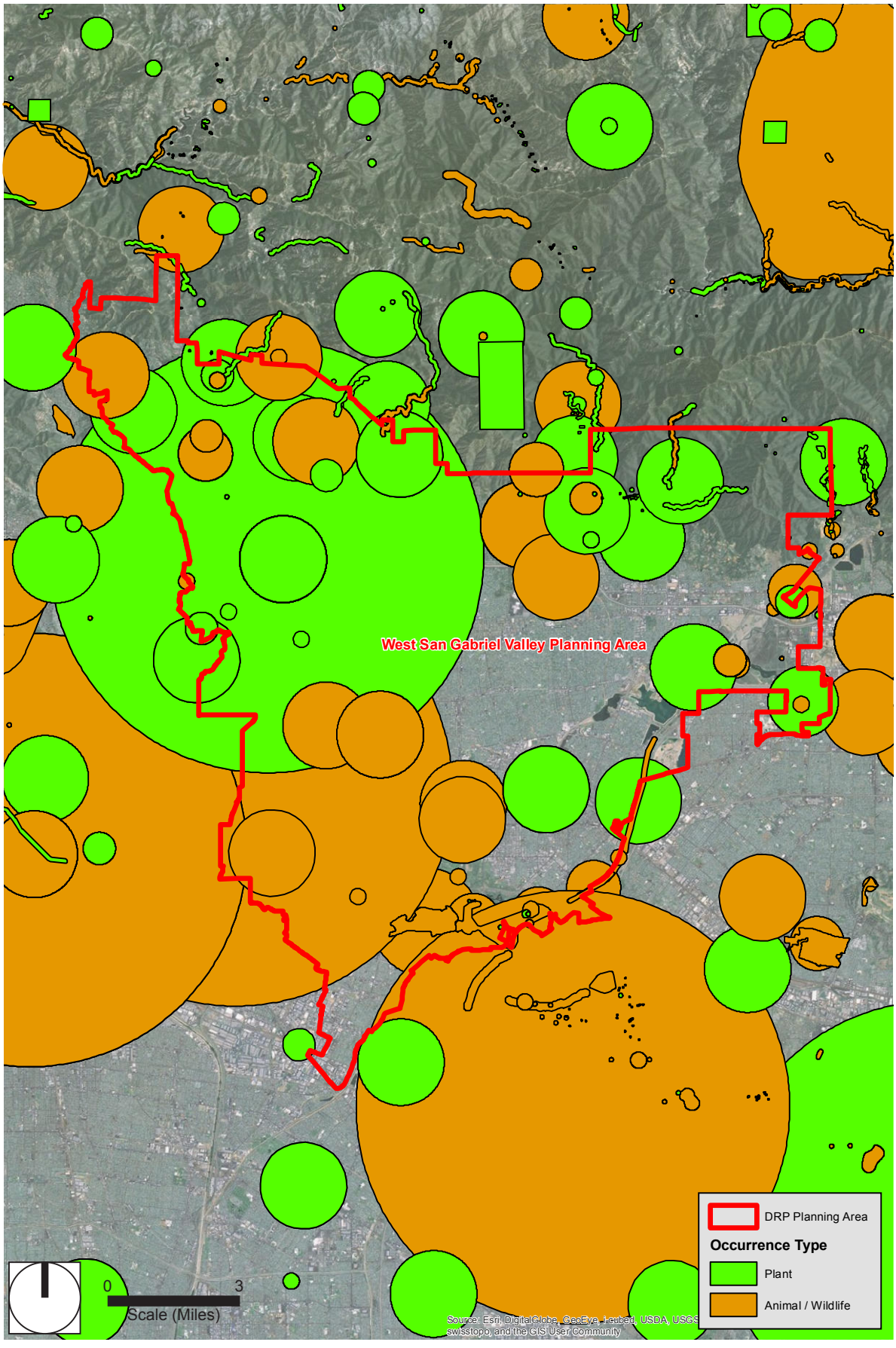

Los Angeles
East San Gabriel Valley Planning Area
San Bernardino
Riverside
Orange
Study Area Boundary / L.A. County Boundary
DRP Planning
Occurrence Type
Plant
Animal / Wildlife
0
5
Scale (Miles)

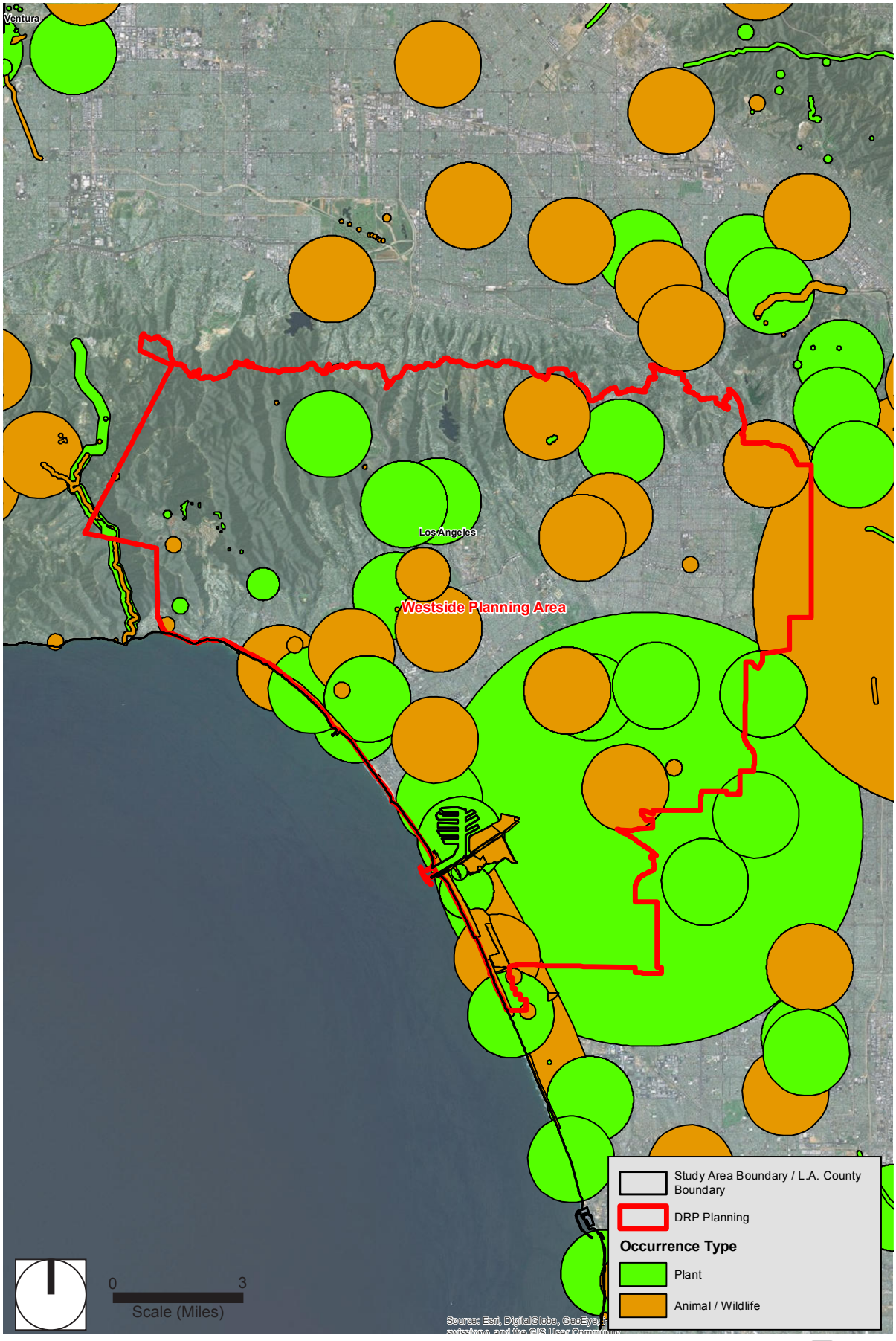

Gateway Planning Area
Los Angeles
Gateway Planning Area
Orange
Study Area Boundary / L.A. County Boundary
DRP Planning
Occurrence Type
Plant
Animal / Wildlife
0
3
Scale (Miles)


Metro Planning Area
Los Angeles
Study Area Boundary / L.A. County Boundary
DRP Planning
Occurrence Type
Plant
Animal / Wildlife
0
3
Scale (Miles)


Ventura
Los Angeles
San Fernando Valley Planning Area
Study Area Boundary / L.A. County Boundary
DRP Planning
Occurrence Type
Plant
Animal / Wildlife
0
3
Scale (Miles)
Source: Esri, DigitalGlobe, GeoEye, i-


Los Angeles
South Bay Planning Area
Study Area Boundary / L.A. County Boundary
DRP Planning
Occurrence Type
Plant
Animal / Wildlife
0
3
Scale (Miles)


West San Gabriel Valley Planning Area
DRP Planning Area
Occurrence Type
Plant
Animal / Wildlife
0
3
Scale (Miles)
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Ventura
Los Angeles
Westside Planning Area
Study Area Boundary / L.A. County Boundary
DRP Planning
Occurrence Type
Plant
Animal / Wildlife
0
3
Scale (Miles)

Appendix H2
Final EIR and Statement for the West Mojave Plan

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U.S. Department of the Interior
Bureau of Land Management
California Desert District
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553

January 2005

Final Environmental Impact Report and Statement for the

West Mojave Plan

A Habitat Conservation Plan and California Desert Conservation Area Plan Amendment
Vol 1



The Bureau of Land Management Today

Our Vision

To enhance the quality of life for all citizens through the balanced stewardship of America's public lands and resources.

Our Mission

To sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

Our Values

To serve with honesty, integrity, accountability, respect, courage, and commitment to make a difference.

Our Priorities

To improve the health and productivity of the land to support the BLM multiple-use mission.

To cultivate community-based conservation, citizen-centered stewardship, and partnership through consultation, cooperation, and communication.

To respect, value, and support our employees, giving them resources and opportunities to succeed.

To pursue excellence in business practices, improve accountability to our stakeholders, and deliver better service to our customers.

BLM/CA/ES-2004-005 + 1790 -1600

United States
Department of the Interior
BUREAU OF LAND MANAGEMENT
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553

January, 2005

Dear Reader:

Enclosed is the *Final Environmental Impact Report and Statement (Final EIR/S) for the West Mojave Plan*. The Bureau of Land Management (BLM), the federal lead agency, has prepared the Final EIR/S in accordance with the National Environmental Policy Act (NEPA). The County of San Bernardino and the City of Barstow, the California lead agencies, have prepared the Final EIR/S in accordance with the California Environmental Quality Act (CEQA).

This Final EIR/S is a comprehensive environmental analysis of seven alternatives (including the No Action Alternative) that address compliance with the federal and California endangered species acts (FESA and CESA, respectively).

The purpose of the West Mojave Plan is to develop management strategies for the desert tortoise, Mohave ground squirrel and over 100 other sensitive plants and animals that would conserve those species throughout the western Mojave Desert, while at the same time establishing a streamlined program for compliance with the regulatory requirements of FESA and CESA. Agencies, local jurisdictions and others with a stake in the future of the western Mojave Desert have collaborated in the development of the West Mojave Plan.

The public devoted substantial effort to providing in-depth review and input on the Draft EIR/S. During the 90-day public review of the Draft EIR/S, which ended on September 12, 2003, commentators submitted nearly 300 letters. These offered numerous suggestions, comments and opinions concerning the Draft EIR/S. Responses to comments are presented in Chapter 6 of the Final EIR/S, and copies of all letters received can be found on the attached compact disk.

The text of the Final EIR/S includes a number of changes and corrections suggested by commentators. Where the text of the Final EIR/S differs from that presented in the Draft EIR/S, a vertical black line in the left-hand margin indicates the location of the modified or clarified text. A summary of these modifications follows. Because most of the changes consisted of minor modifications, only a selection is presented below.

- Conservation Area adjustments
    - Pisgah Crater (western portion dropped, expansion to northeast)
    - North Edwards (some lands excluded)
    - Alkali Mariposa Lily (realigned to capture the Amargosa Creek drainage, drop

interim conservation areas)

- Biological Transition Areas eliminated (portions added to DWMA)
- New biological objectives for several species
- Tortoise Survey Zones – minor modifications
- Fee Zones – minor modifications
- BLM DWMA Multiple Use Class M Lands changed to Class L
- Revised Monitoring and Adaptive Management Table
- Additional discussion of cumulative impacts
- Appendix C.1 (Implementation Tasks, Costs and Priorities) Revision
- Compact Disk Additions – species accounts, vegetation map, Draft EIR/S comment letters
- BLM Route Designation
    - Adoption of Competitive "C" Routes Northwest of Spangler Open Area
    - Route Openings in Summit Range
    - Route closures in Fremont Kramer Tortoise DWMA to Offset "C" Routes
    - Selected closures in small conservation areas
    - Revised Juniper Subregion route network
    - "No Action" route network is BLM June 30, 2003 Decision Record

The West Mojave Plan proposes a number of amendments to the BLM's California Desert Conservation Area Plan. The BLM planning process includes an opportunity for administrative review through a plan protest to the BLM Director should a previous commentator on the plan believe that the decision has been issued in error. Only those persons or organizations that participated in the planning process may protest. Protests from parties having no previous involvement will be denied without further review. A protesting party may raise only those issues that were submitted for the record during the planning process. New issues raised in the protest period should be directed to the BLM, California Desert District Manager, 22835 Calle San Juan De Los Lagos, Moreno Valley, CA 92553 for consideration in plan implementation, as potential plan amendments, or as otherwise appropriate. The period for filing protests begins when the EPA publishes in the Federal Register its Notice of Receipt of the West Mojave Plan Final EIR/S. To be considered "timely" the protest must be postmarked no later than the last day of the 30-day protest period. Also, although not a requirement, it is recommended that the protest be sent by certified mail, return receipt requested. E-mail protests will not be accepted. Faxed protests will be considered as potential valid protests provided (1) that the signed faxed letter is received by the BLM Washington Office protest coordinator by the closing date of the protest period and (2) that the protesting party also provides the original letter by either regular or overnight mail postmarked by the close of the protest period. Please direct faxed protests to "BLM Protest Coordinator" at 202-452-5112. Please direct the follow-up letter to the appropriate address provided below.

Protest must be filed in writing to: Director (210), Attention: Brenda Williams, P.O. Box 66538, Washington, D.C. 20035, or by overnight mail to: Director (210), Attention: Brenda Williams, 1620 L Street, N.W., Suite 1075, Washington, D.C. 20036. In order to be considered complete, the protest must contain, at a minimum, the following information:

1. The name, mailing address, telephone number, and interest of the person filing the protest.
2. A statement of the issue or issues being protested.
3. A statement of the part or parts of the plan being protested. To the extent possible, this should be done by reference to specific pages, paragraphs, sections, tables, maps, etc. included in the Final EIS.
4. A copy of all documents addressing the issue or issues that were submitted during the planning process or a reference to the date the issue or issues were discussed by you for the record.
5. A concise statement explaining why the decision of the BLM California State Director is believed to be incorrect. This is a critical part of the protest. Take care to document all relevant facts. As much as possible, reference or cite the planning documents, environmental analysis documents, available planning records (i.e. meeting minutes or summaries, correspondence, etc.) A protest that merely expresses disagreement with proposed decision without supporting data will not provide additional basis for the Director's review of the decision.

Please note that comments, including names and street addresses of respondents, are available for public review an/or release under the Freedom of Information Act (FOIA). Individual respondents may request confidentiality. Respondents who wish to withhold name and/or street address from public review or from disclosure under FOIA, must state this prominently at the beginning of the written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials or organizations or businesses, will be made available for public inspection in their entirety.

The BLM Director will promptly render a decision on the protest. The decision will be in writing and will be sent to the protesting party by certified mail, return receipt requested. The decision of the Director shall be the final decision of the Department of the Interior.

Sincerely,

Linda Hansen

Linda Hansen
District Manager

Enclosure (2 volume set)

Proposed West Mojave Plan
Final Environmental Impact Report and Statement

Federal Lead Agency:	U.S. Department of the Interior Bureau of Land Management California Desert District Office
California Lead Agencies:	County of San Bernardino Land Use Services Department City of Barstow Community Development Department
Project Location:	Portions of San Bernardino, Inyo, Kern and Los Angeles Counties, California
For Further Information:	Linda Hansen, Bureau of Land Management California Desert District Office 22835 Calle San Juan De Los Lagos Moreno Valley, CA 92553 Randy Scott, County of San Bernardino Land Use Services Department 385 North Arrowhead Avenue San Bernardino, CA 92415 Scott Priester, City of Barstow Community Development Department 220 East Mountain View Street Barstow, CA 92311-2888
Abstract	The West Mojave Plan (Plan) is a habitat conservation plan and federal land use plan amendment that presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel and nearly 100 other sensitive plants and animals and the natural communities of which they are a part, while providing a streamlined program for complying with the requirements of the California and federal Endangered Species Acts (CESA and FESA, respectively). The planning area includes 3.2 million acres of public land and 3.0 million acres of private land. This document was produced through a collaborative effort of state and federal agencies and local jurisdictions.

West Mojave Plan

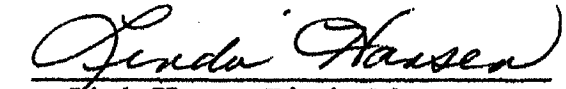
A Habitat Conservation Plan and
California Desert Conservation Area Plan Amendment

Final Environmental Impact Report And Statement

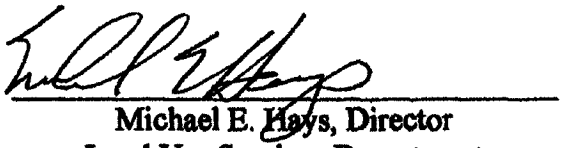
January, 2005



Michael Pool, State Director
Bureau of Land Management



Linda Hansen, District Manager
California Desert District
Bureau of Land Management



Michael E. Hays, Director
Land Use Services Department
County of San Bernardino



Scott Priester, Director
Community Development Department
City of Barstow

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EXECUTIVE SUMMARY

E.1 INTRODUCTION

The West Mojave Plan (Plan) is a habitat conservation plan and federal land use plan amendment that (1) presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel (MGS) and nearly 100 other sensitive plants and animals and the natural communities of which they are a part, and (2) provides a streamlined program for complying with the requirements of the California and federal Endangered Species Acts (CESA and FESA, respectively).

The Plan is being prepared through the collaborative effort of cities, counties, state and federal agencies having jurisdiction over lands within the region. The Plan will allow streamlined project permitting at the local level, equitable sharing of costs among participants, and shared stewardship of biotic resources. The collaborators include:

- **Local Jurisdictions:** The cities of Adelanto, Barstow, California City, Hesperia, Lancaster, Palmdale, Ridgecrest, Twentynine Palms, and Victorville, and the towns of Apple Valley and Yucca Valley; the Counties of Inyo, Kern, Los Angeles and San Bernardino; and the Indian Wells Valley Water District.
- **State of California:** The California Department of Fish and Game and California Department of Transportation
- **Federal:** The Bureau of Land Management and the United States Fish and Wildlife Service.

These agencies and local jurisdictions are cooperating with a variety of non-governmental organizations, including businesses, environmental organizations, user groups and others with a stake in the future management of the planning area, to develop the West Mojave Plan. Over 100 non-governmental organizations (NGO) have participated in this process. Representatives of the agencies, jurisdictions and NGOs comprise the West Mojave ***Supergroup***.

The 9,359,070-acre planning area is located to the north of the Los Angeles metropolitan area. The Plan's conservation program applies to both public and private lands within this area. These lands include 3,263,874 acres of BLM-administered public lands, 3,029,230 acres of private lands and 102,168 acres of lands administered by the State of California.

This Executive Summary is organized as follows:

- A brief description of each of the seven alternatives analyzed by this Environmental Impact Report and Statement (EIR/S).
- A summary of the impacts that would result from implementing each alternative.
- A discussion of the relative likelihood that each of the seven alternatives would achieve the biological goals and objectives established for each of nearly 100 sensitive species addressed by this plan.

Responses to comments received on the Draft EIR/S are presented in Chapter 6. Many of the comments requested modifications or clarifications of either the West Mojave Plan's conservation strategy or the environmental analysis presented in the Draft EIR/S. Where the text of the Final EIR/S differs from that presented in the Draft EIR/S, a vertical black line in the left-hand margin indicates the location of the modified or clarified text. A summary of these modifications follows. Because most of the changes consisted of minor modifications, only a selection is presented below.

- Conservation Area adjustments
    - Pisgah Crater (western portion dropped, expansion to northeast)
    - North Edwards (some lands excluded)
    - Alkali Mariposa Lily (realigned to capture the Amargosa Creek drainage, drop interim conservation areas)
- Biological Transition Areas eliminated (portions added to DWMA)
- New biological objectives for several species
- Tortoise Survey Zones – minor modifications
- Fee Zones – minor modifications
- BLM DWMA Multiple Use Class M Lands changed to Class L
- Revised Monitoring and Adaptive Management Table
- Additional discussion of cumulative impacts
- Appendix C.1 (Implementation Tasks, Costs and Priorities) Revision
- Compact Disk Additions – species accounts, vegetation map, comment letters
- BLM Route Designation
    - Adoption of Competitive "C" Routes Northwest of Spangler Open Area
    - Route Openings in Summit Range
    - Route closures in Fremont Kramer Tortoise DWMA to Offset "C" Routes
    - Selected closures in small conservation areas
    - Revised Juniper Subregion route network
    - "No Action" route network is BLM June 30, 2003 Decision Record

E.2 ALTERNATIVES

The West Mojave Plan identifies measurable biological goals and objectives for each of the sensitive species that is addressed by the Plan. This Final EIR/S examines seven alternative conservation strategies, each of which presents a different and unique approach to achieving those biological goals and objectives. The seven alternatives include the following:

- **Alternative A: PROPOSED ACTION - HABITAT CONSERVATION PLAN.** This alternative presents a multi-species conservation strategy applicable to public and private lands throughout the planning area. It would serve as (1) an amendment of BLM's CDCA Plan for public lands, and (2) a "habitat conservation plan" for private lands. Incidental take permits for 49 "covered species" would be issued to participating local jurisdictions and state agencies.

- **Alternative B: BLM Only.** This alternative consists of those elements of Alternative A that are applicable to, and that could be implemented on, BLM-administered public lands. It is applicable to public lands only.
- **Alternative C: Tortoise Recovery Plan.** This combines those elements of Alternative A that are applicable to the Mohave ground squirrel and other sensitive species with the management program recommended by the 1994 Desert Tortoise (Mojave Population) Recovery Plan. CDCA Plan amendments and a habitat conservation plan would be adopted and incidental take permits would be issued to participating local jurisdictions and state agencies. The public expressly requested detailed consideration of this alternative during NEPA scoping meetings.
- **Alternative D: Enhanced Ecosystem Protection.** This alternative places a high priority on the conservation of sensitive plants and animals, even if adoption of those recommendations would limit motorized vehicle access to and multiple use of the western Mojave Desert. Its recommendations had their origin in discussions among the participating agencies and members of the public during NEPA scoping and the development of Alternative A. CDCA Plan amendments and a habitat conservation plan would be adopted and incidental take permits would be issued to participating local jurisdictions and state agencies.
- **Alternative E: One DWMA – Enhanced Recreation Opportunities.** This alternative places a high priority on multiple uses of desert lands, including motorized vehicle recreation, even if this might preclude the implementation of some of the programs that otherwise might be implemented to conserve species and ecosystems. It also responds to a specific request raised by the public during scoping meetings that the EIR/S explore whether a single DWMA, protecting only the remaining areas of relatively higher tortoise populations, might be an effective means of conserving desert tortoises. CDCA Plan amendments and a habitat conservation plan would be adopted and incidental take permits would be issued to participating local jurisdictions and state agencies.
- **Alternative F: No DWMA – Aggressive Disease and Raven Management.** This alternative proposes a tortoise conservation strategy that relies on an aggressive program of tortoise disease management and raven control, supported by limited fencing, rather than the establishment of tortoise DWMAs to protect habitat. Subject to these modifications, the Alternative A conservation program for other species would be implemented. CDCA Plan amendments and a habitat conservation plan would be adopted and incidental take permits would be issued to participating local jurisdictions and state agencies.
- **Alternative G: No Action.** Existing conservation strategies currently being applied by each of the participating agencies would continue to be implemented.

E.3 SUMMARY OF IMPACTS

Alternatives A through E vary in the amount of new conservation within DWMAs, ACECs, and Conservation Areas from 1.20 million acres (19.8% of the total of undisturbed lands) to 1.79 million acres (29.4%) in Alternative C. These new conservation areas add to the existing 1.15 million acres (18.4%) and achieve much greater protection of desert tortoise habitat. For the primary communities of this habitat, creosote bush scrub and saltbush scrub, the

increase in habitat conservation is 23-34%. The proportional increase is similar for the Mohave ground squirrel.

In addition to increasing the quantity of habitat conserved, the Plan focuses on protecting the highest quality tortoise and ground squirrel habitat, as defined by highest sign counts and live tortoises and persistent capture locations for the Mohave ground squirrel. The alternatives incorporating private land conservation (A, C, D, E) create large habitat blocks capable of sustaining ecosystem processes, landform diversity, all trophic levels and populations large enough to be viable in the face of fluctuations caused by the extreme desert environment. For the desert tortoise, maintenance of conserved habitat with a high carrying capacity is necessary for recovery after the disease runs its course or a cure is found, and after raven predation is reduced.

The Plan presents significant cumulative impacts, both positive and negative to most of the covered species. The beneficial cumulative impacts include the establishment of large, unfragmented habitat blocks, measures to reduce tortoise mortality, measures to minimize disturbance impacts to conserved lands and measures addressing unique components of diversity, such as endemic species, disjuncts and habitat specialists. The provision of incidental take areas where permitting is streamlined accommodates development of large acreages of disturbed lands and degraded habitat. The developed lands put increasing pressure on the conserved lands, from resource extraction, incidental land uses such as utilities and from recreation. The allowable loss of habitat exceeds conservation in all alternatives. Cumulatively this loss would reduce populations of many common species in a very substantial way. As long as the covered species, which are the rarest and those with known declines, are adequately conserved in the Habitat Conservation Area, the cumulative impact would not be significant or adverse. The more common species would survive within the HCA and are present in abundance outside the west Mojave as well.

Although large acreages are available as incidental take areas, not all of these lands would be developed or even disturbed during the term of the Plan. The growth projections for urban development can be accommodated on a small fraction of the land within the ITA. Many areas without water, utilities, or easy access would remain undeveloped, even from rural residences. The monitoring and adaptive management aspects of the Plan would track the success of the conservation measures, and these undeveloped lands would remain available if alterations are needed in the quantity of conserved lands in the future. They are also available for future recreation areas and for developments such as mining or energy production that can be pursued in remote areas. The allocation of lands for different uses achieved by the West Mojave Plan should not be considered as the final determination of land use for the planning area. It is rather a dynamic process of utilizing the best available science and land use planning to achieve conservation of the species and communities known to be in jeopardy. Technologies of the future can and are expected to alter provisions of the Plan to improve upon the implementation of its objectives.

Motorized Vehicle Access Network Mileage: Alternative A proposes minor modifications of a BLM route network adopted on June 30, 2003 that includes 2,265 miles of open routes within a “redesign area”, 159 miles within the Ord Pilot region, 406 miles within

ACECs for which route networks were designated after 1980, and 2,268 miles of remaining 1985-87 designations, or 5,098 miles overall, a total that includes single-track motorcycle routes. Proposed mileage of non-motorcycle routes in higher density tortoise population areas would be 384, a decrease from the 439 miles that were open prior to June 30, 2003. The 406 miles within the ACECs would be less than the pre-June 30, 2003 total of 427. Within the Juniper subregion, a redesigned network consisting of 73 miles of open routes and 25 miles of routes limited to use by single-track vehicles (e.g. motorcycles) would replace the 152 miles of open routes adopted on June 30, 2003.

E.4 BIOLOGICAL GOALS AND OBJECTIVES: WOULD THEY BE MET?

E.4.1 Desert Tortoise

This section considers the four biological goals and associated objectives identified for desert tortoise conservation by the USFWS and CDFG in 1998 during biological evaluation meetings (U.S. Bureau of Land Management 1999). The goals and objectives are reiterated, and followed by tables that indicate for each alternative whether the goals and objectives are met or not. Generalized summary statements follow indicating why certain objectives are met or not.

Alternatives are reiterated as follows:

- **Alternative A:** Proposed Action – Habitat Conservation Plan
- **Alternative B:** BLM Only
- **Alternative C:** Tortoise Recovery Plan
- **Alternative D:** Enhanced Ecosystem Protection
- **Alternative E:** One DWMA – Enhanced Recreation Opportunities
- **Alternative F:** No DWMA – Aggressive Disease and Raven Management
- **Alternative G:** No Action

Goal 1: Protect sufficient habitat to ensure long-term tortoise population viability (see Table ES-1).

Objective 1.1: Establish a minimum of three, preferably four, Desert Wildlife Management Areas that would be managed for the long-term survival and recovery of the desert tortoise, and which would also benefit other special-status plant and animal species.
Objective 1.2: Ensure that at least one DWMA exceeds 1,000 square miles in size
Objective 1.3: Design DWMAs so that they are well distributed across the recovery unit, edge-to-area ratios are minimized, impediments to the movement of tortoises are avoided, and (where feasible) boundaries are contiguous.

Table ES-1
Tortoise Biological Goal 1

BIOLOGICAL GOAL 1	SEVEN ALTERNATIVES UNDER CONSIDERATION						
OBJECTIVES	A	B	C	D	E	F	G
1.1 Establish 3 or 4 DWMAs	Yes	Yes	Yes	Yes	No	No	No
1.2 At least one DWMA 1,000 mi^2	Yes	No	Yes	Yes	Yes	No	No
1.3 Good reserve design	Yes	No	Yes	Yes	No	No	No

Alternatives A through D share the common characteristics of establishing four DWMAs, with at least one that is 1,000 mi^2, and incorporating the appropriate reserve design criteria given in Objective 1.3. This is not true for the BLM-only alternative. Although the alternative maintains the external, larger DWMA boundary, private lands are excluded, undermining the adequate DWMA size and configuration (i.e., lack of conservation on private land, checkerboard ownership pattern within the DWMA would undermine conservation efforts). Although Alternative E would result in the establishment of a single 1,000 mi^2 DWMA, it fails to meet Objectives 1.1 and 1.3. Alternatives F and G would fail to establish any DWMAs, and therefore would fail to meet any of the three criteria.

Goal 2: Establish an upward or stationary trend in the tortoise population of the West Mojave Recovery Unit for at least 25 years (see Table ES-2).

Objective 2.1: Achieve population growth rates (lamdas) within DWMAs of at least 1.0.
Objective 2.2: Attain a minimum average population density of 10 adult female tortoises per square mile within each DWMA.
Objective 2.3: Establish a program for tortoise population monitoring that would detect an increase, decrease, or stable trend in tortoise population densities, and include an information feedback loop that ensures that necessary changes would be made in management.

Table ES-2
Tortoise Biological Goal 2

BIOLOGICAL GOAL 2	SEVEN ALTERNATIVES UNDER CONSIDERATION						
OBJECTIVES	A	B	C	D	E	F	G
2.1 Achieve stable populations	Unk	Unk	Unk	Unk	No	No	No
2.2 Achieve 10 females/mi^2	Unk	Unk	Unk	Unk	No	No	No
2.3 Population monitoring	No	No	No	No	No	No	No

There are limited means of assessing the seven alternatives in their efficacy to meet Goal 2 and its objectives. Success would be measured in terms of the population's response to implementing proactive conservation programs identified in each alternative. Achieving stable populations and a certain density of tortoises per square mile is unknown for the first four alternatives. Although Alternative E would result in the establishment of a single DWMA, even if the objectives were met for so small an area, poor reserve design, including very high surface area to boundary ratio, would effectively undermine the efficacy of conservation. Failure to establish DWMAs under Alternatives F and G would exacerbate rather than facilitate attaining these objectives.

Unfortunately, the ability to realize Goal 2, for all alternatives, is hampered by the likelihood of catastrophic die-offs that could ultimately extirpate tortoises regardless of proactive conservation management. It would also appear that distance sampling, which is suggested as the means of monitoring the population, might fail in its ability to detect increases or decreases in the population. The methodology does fairly well to measure rapid declines in the population over a three to five year period, but would fail to detect gradual increases, which may take a dozen or more years to detect. The method would be better applied in above-average concentration areas, as a tool to detect die-offs; continuing to apply it in extirpation areas will result in low sample sizes, which would fail to meet the minimum sample size of 80 tortoises/stratum required by the methodology.

Goal 3: Ensure genetic connectivity among desert tortoise populations, both within the West Mojave Recovery Unit, and between this and other recovery units (see Table ES-3).

Objective 3.1: Delineate and maintain movement corridors between DWMAs, and with the Eastern Mojave Recovery Unit, the Eastern Colorado Recovery Unit, and the Northern Colorado Recovery Unit.
Objective 3.2: Ensure a minimum width of two miles for movement corridors, and include provisions for major highway crossings.

Table ES-3
Biological Goal 3

BIOLOGICAL GOAL 3	SEVEN ALTERNATIVES UNDER CONSIDERATION						
OBJECTIVES	A	B	C	D	E	F	G
3.1 Delineate movement corridors	No	No	No	No	No	No	No
3.1 Connectivity to eastern recovery unit	No	No	No	No	No	No	No
3.2 Minimum width for connectors	No	No	No	No	No	No	No

As indicated in the table, none of the objectives would be realized by any of the alternatives. However, one has to question the validity of the biological goal in the first place. For example the four critical habitat units designated by the USFWS and analogous DWMAs recommended by the recovery team were used to derive the current proposals, yet with the exception of a small part of the Superior-Cronese DWMA, which is contiguous with the Eastern Mojave Recovery Unit, there are no places where connectivity between conservation areas is possible.

Given highways, freeways, and the city of Barstow, there was never an opportunity to connect the Ord-Rodman DWMA with either of the western DWMAs. Connectivity between the three DWMAs to the west with the Pinto Mountain DWMA was never physically possible. Fort Irwin occupies most of the contiguous areas between the Western Mojave Recovery Unit and the Eastern Mojave Recovery Unit; 29 Palms Marine Corps Base occupies most of the contiguous boundary with the Northern Colorado Recovery Unit; and Joshua Tree National Park completely encompasses the mutual boundary between the Western Mojave and Eastern Colorado recovery units. Given that the Department of Defense and National Park Service manage these areas, respectively, there was never any opportunity for BLM to establish conservation areas in these

places to provide for connectivity. Even so, there are undeveloped (albeit severely degraded on military installations) habitats between areas in the West Mojave and recovery units to the east, which will allow for genetic transfer. National Park Service management, in combination with the BLM's Chuckwalla DWMA of the NECO Plan, provides for conserved and connected habitat to the Eastern Colorado Recovery Unit.

There is also the question of whether or not connectivity is appropriate in the West Mojave. Sign count data collected since 1998 revealed that there appears to be a spread of disease or some other mortality factor that may be facilitated by the connectivity suggested in the recovery plan. If these patterns are truly resulting from disease spread, one needs to question the validity of maintaining connectivity among conservation areas. Having the Ord-Rodman and Pinto Mountain DWMAs physically separated from the two western DWMAs may strengthen the conservation strategy because there is no connectivity and they may be less vulnerable to regional spread of disease.

That the alternatives fail to result in connectivity among the DWMAs and adjacent recovery units is not considered a serious flaw with any of the alternatives for the reasons given above. Although there is no connectivity between conservation areas, there are still habitats crossing these borders that will allow tortoises to pass unimpeded from one recovery unit to an adjacent one. It is strongly recommended that the new recovery team consider the issue of connectivity in light of the new information now available.

Goal 4: Reduce tortoise mortality resulting from interspecific (i.e., raven predation) and intraspecific (i.e., disease) conflicts that likely result from human-induced changes in the ecosystem processes (see Table ES-4).

Objective 4.1: Initiate proactive management programs addressing each conflict, to be implemented by each affected agency or jurisdiction.
Objective 4.2: Establish an environmental education program to facilitate public understanding and support for proactive management programs necessary to reduce tortoise mortality.
Objective 4.3: Continue research programs and monitoring programs that assess the relative importance of human activities and natural processes that affect desert tortoise populations.

Table ES-4
Tortoise Biological Goal 4

BIOLOGICAL GOAL 4	SEVEN ALTERNATIVES UNDER CONSIDERATION						
OBJECTIVES	A	B	C	D	E	F	G
4.1 Address each conflict	Yes	No	Yes	Yes	No	No	No
4.2 Establish education program	Yes	Yes	Yes	Yes	Yes	Yes	No
4.3 Continue research and monitoring	Yes	No	Yes	Yes	No	No	No

Alternative A, upon which Alternatives C and D are predicated, was specifically designed to address the 22 known or suspected threats to tortoises discussed in the recovery plan and recently summarized by Boarman (2002). Each program must be considered on its own merits,

but in general, Alternatives A, C, and D were designed with these threats in mind, and are intended to meet Objective 3.1. Their efficacy is susceptible to limited funding, public support, and many other factors that are not easily foreseeable or controlled.

Effective conservation must necessarily rely on cooperation among all land managers, and include both private and public lands. Alternative B would fail to implement Objective 3.1 for this reason. Alternative E could work to implement Objective 3.1 in the 1,000 mi^2 area, but its relatively small size and high area to edge ratio fatally flaws it as providing for regional tortoise conservation. The focus on disease and raven management is too narrow to allow Alternative F to accomplish the objective.

Establishing an education program is often touted as important to regional conservation plans yet is seldom realized or implemented. In spite of this ubiquitous problem, each of the alternatives (excepting Alternative G, No Action) proposes some form of enhanced education. For this objective to be realized, managers must take a different, proactive look at regional education, or the conservation strategy is likely to be undermined.

Research and monitoring (Objective 4.3) are strongly encouraged for Alternatives A, C, and D but are missing, or only partially applied (Alternative F), in the remaining alternatives. It is difficult (and questionable) to assign limited funds to continued research when there are numerous, costly conservation programs that need to be implemented. Monitoring is essential, but the efficacy of distance sampling to function as intended is questionable.

E.4.2 Mohave Ground Squirrel

Table ES-5 presents an overview of the likely success of each alternative in meeting the biological goals established by the West Mojave Plan for the threatened Mohave ground squirrel.

Table ES-5
Mohave Ground Squirrel Biological Goals

	Biological Goals Met or Not: comparisons among alternatives						
Goal 1. Ensure long-term protection of MGS habitat throughout the species range.							
Objectives for Goal 1	A	B	C	D	E	F	G
Upon Plan adoption, establish management areas for the long-term conservation of MGS habitat: **1.1a** Establish the MGS CA for the protection of unfragmented habitats outside military installations.	Yes	No	Yes	Yes	No	No	No
1.1b Establish BTAs to minimize indirect impacts of human development to the MGS CA	Yes	No	No	Yes	No	No	No
1.2 Allow for adjustments to the MGS CA boundary based on findings of scientific studies.	Yes	No	Yes	Yes	No	No	No
1.3 Implement appropriate actions to ensure the long-term protection of habitat in the MGS CA throughout the life of the Plan.	Yes	No	Yes	Yes	No	No	No
1.4 On a yearly basis, track the loss of MGS habitat resulting from Plan implementation.	Yes	Yes	Yes	Yes	Yes	Yes	No

	Biological Goals Met or Not: comparisons among alternatives						
1.5 Cooperate with military installations by sharing scientific information and reviewing management plans (INRMP, CLUMP, etc) to assist environmental managers in evaluating MGS habitat protection on the bases.	Yes	Yes	Yes	Yes	Yes	Yes	No
Goal 2. Ensure long-term viability of the MGS throughout its range.							
Objectives for Goal 2							
2.1 As per the mandate of the CDFG, minimize and fully mitigate the impacts of the Plan's authorized incidental take of the MGS throughout the life of the Plan.	Yes	No	Yes	Yes	No	No	No
2.2 Upon Plan adoption, initiate and conduct studies that would determine the following measurable biological parameters: (a) the regional status, (b) potential "hot spots" (refugia), (c) genetic variation throughout the range, and (d) the ecological requirements of the MGS.	Yes	No	Yes	Yes	No	No	No
2.3 Establish long-term study plots throughout the range and annually monitor their MGS populations. Fund continued monitoring in the Coso Range to provide baseline population data.	Yes	No	Yes	Yes	No	No	No
2.4 Use the biological and population data from Goal 2, Objectives 2 and 3 to modify the management prescriptions, as warranted, to ensure the long-term viability of the species.	Yes	No	Yes	Yes	No	No	No

The findings here are similar to those for the tortoise; Alternatives A, C, and D, with a few exceptions, would better realize MGS conservation than the other alternatives. The same flaws identified with Alternatives B, E, F, and G for the tortoise would apply to MGS conservation. Given that the species is only State-listed, Alternatives B and G would, for the most part, be the same.

E.4.3 Other Species

Table ES-6 presents a summary in comparative form of acres of habitat conserved, and acres available for incidental take, for each covered species addressed by the West Mojave Plan for each alternative.

Table ES-6
Acreage of Conservation and Incidental Take of Covered Species in Each Alternative.

	A **PREFERRED**		B BLM ONLY*		C RECOVERY PLAN		D ENHANCED ECOSYSTEM		E ENHANCED RECREATION		F DISEASE AND RAVEN		G NO ACTION***	
	Conserved	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**
Desert tortoise	1,477,630	See text for ITA	1,023,329	454,301 in DWMA. See text for ITA	1,514,847	See text for ITA	1,505,494	4,393 See text for ITA	715,424	4,393 in DWMA. See text for ITA	See text – different approach		DTNA, Cat 1 habitat	Unk.
Mohave ground squirrel	1,701,947	See text for ITA	1,280,106	See text for ITA	1,701,947	See text for ITA	1,701,947	See text for ITA	1,701,947	See text for ITA	1,701,947	See text for ITA	0	Unk.
Alkali Mariposa Lily	Permanent = 3,500+ Isolated sites	40,861	0	40,861	Permanent = 3,500+ Isolated sites	40,861	Permanent = 3,500+ Isolated sites	40,861	Permanent = 3,500+ Isolated sites	40,861	Permanent = 3,500+ Isolated sites	40,861	0**	68,171
Barstow Woolly Sunflower	50,548+	50	17,682+	32,872	50,548+	50	50,548+	50	50,548+	50	50,548+	50	0	Unk., estimated at 32,872 +
Bats	All significant roosts	< 25 bats at any one site	All significant roosts	No t limited	All significant roosts	< 25 bats at any one site	All significant roosts	< 25 bats at any one site	All significant roosts	< 25 bats at any one site	All significant roosts	< 25 bats at any one site	Roosts gated on case-by-case basis	Unk.
Bendire's Thrasher*	132,497	3,973	132,497	3,973	132,497	3,973	132,497	3,973	132,497	3,973	132,497	3,973	106,710	29,760
Brown-crested flycatcher	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	Big Morongo ACEC	Unk.
Burrowing owl	Unk.	No mortality. Limited.	Occurrences on BLM lands	No mortality. Limited.	Unk.	No mortality. Limited.	Unk.	No mortality. Limited.	Unk.	No mortality. Limited.	Unk.	No mortality. Limited.	0**	Unlimited
Carbonate Endemic Plants	5,169	Minimal	4,393	776	5,169	Minimal	5,169	Minimal	5,169	Minimal	5,169	Minimal	0	Unk.
Charlotte's phacelia	All known sites	50	30 of 37 sites	7 sites	All known sites	50	All known sites	50	All known sites	50	All known sites	50	30 of 37 sites	7 sites
Crucifixion thorn	All known sites	50	All known sites	50	All known sites	50	All known sites	50	All known sites	50	All known sites	50	0	Unk.
Desert cymopterus	Most occupied habitat	50	Most occupied habitat	50	Most occupied habitat	50	Most occupied habitat	50	Most occupied habitat	50	Most occupied habitat	50	0	Unk. Estimated at 14,343

	A **PREFERRED**		B BLM ONLY*		C RECOVERY PLAN		D ENHANCED ECOSYSTEM		E ENHANCED RECREATION		F DISEASE AND RAVEN		G NO ACTION***	
	Conserved	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**
Ferruginous hawk	Prevents and remedies electrocution threat	Unknown but minimized	Prevents and remedies electrocution threat on BLM lands	Potential electrocutions on private lands	Prevents and remedies electrocution threat	Minimized	Prevents and remedies electrocution threat	Minimized	Prevents and remedies electrocution threat	Minimized	Prevents and remedies electrocution threat	Minimized	Electrocution threat minimized for new power lines on BLM lands	Unk.
Golden eagle*	20,495 at Middle Knob. Prevents and remedies electrocution threat. Minimizes mining impacts.	0	17,671 at Middle Knob. Prevents and remedies electrocution threat on BLM lands	0	20,495 at Middle Knob. Prevents and remedies electrocution threat. Minimizes mining impacts.	0	20,495 at Middle Knob. Prevents and remedies electrocution threat. Minimizes mining impacts.	0	20,495 at Middle Knob. Prevents and remedies electrocution threat. Minimizes mining impacts.	0	20,495 at Middle Knob. Prevents and remedies electrocution threat. Minimizes mining impacts.	0	20,495 at Middle Knob. Electrocution threat minimized for new power lines on BLM lands	0
Gray vireo	15,954+	Unk.	4,393+	Unk.	15,954+	Unk.	15,954+	Unk.	15,954+	Unk.	15,954+	Unk.	0**	Unk.
Inyo California towhee	98% of area (public lands)	2% of area (private lands)	98% of area (public lands)	2% of area (private lands)	98% of area (public lands)	2% of area (private lands)	98% of area (public lands)	2% of area (private lands)	98% of area (public lands)	2% of area (private lands)	98% of area (public lands)	2% of area (private lands)	98% of area (public lands)	2% of area (private lands)
Kelso Creek Monkeyflower*	1,870	50	1,870	Unk. Minimal	1,870	Unk. Minimal	1,870	Unk. Minimal	1,870	Unk. Minimal	1,870	Unk. Minimal	0**	Unk. Minimal
Kern buckwheat	All except <0.1	<0.1	Most occupied habitat	Estimated 5 acres	All except <0.1	<0.1	All except <0.1	<0.1	All except <0.1	<0.1	All except <0.1	<0.1	Unk.	Estimated 10 acres
Lane Mountain milkvetch	14,597	0	10,164	4,433	14,597	0	14,597	0	14,597	0	14,597	0	Unk.	4,433+
LeConte's thrasher	1,782,892	Unk.	1,392,984	Unk.	1,811,468	Unk.	1,782,892	Unk.	1,521,707	Unk.	48,804+	Unk.	48,804+	Unk.
Little San Bernardino Mountains gilia	All known drainages	50	Sites within JTNP	All other known drainages	All known drainages	50	All known drainages	50	All known drainages	50	All known drainages	50	Sites within JTNP	All other known drainages
Mojave fringe-toed lizard	42,865+	4 sites, see text	37,270	5,595+	42,865+	4 sites, see text	42,865+	4 sites, see text	42,865+	4 sites, see text	42,865+	4 sites, see text	0	Unk.
Mojave monkeyflower	57,087	Unk.	36,630	20,457	57,087	50	57,087	50	57,087	50	57,087	50	0	Unk.
Mojave River vole	All sites (conditional)	0	0	Unk	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	0**	Unk.

	A **PREFERRED**		B BLM ONLY*		C RECOVERY PLAN		D ENHANCED ECOSYSTEM		E ENHANCED RECREATION		F DISEASE AND RAVEN		G NO ACTION***	
	Conserved	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**
Mojave tarplant	All occupied habitat	50 (new locations)	All occupied habitat	Unk.	All occupied habitat	50 (new locations)	All occupied habitat	50 (new locations)	All occupied habitat	50 (new locations)	All occupied habitat	50 (new locations)	All occupied habitat	Unk.
Parish's alkali grass	All of single known site	0	0	Unk.	0	All of single known site	0	All of single known site	0	All of single known site	0	All of single known site	0	Unk.
Parish's phacelia	898	50	512	376	898	50	898	50	898	50	898	50	0	Unk.
Parish's popcorn flower	All of single known site	0	0	Unk.	All of single known site	0	All of single known site	0	All of single known site	0	All of single known site	0	Unk.	Unk.
Prairie falcon	20,495 at Middle Knob. Minimizes mining impacts.	0	17,671 at Middle Knob. Minimizes mining impacts.	0	20,495 at Middle Knob. Minimizes mining impacts.	0	20,495 at Middle Knob. Minimizes mining impacts.	0	20,495 at Middle Knob. Minimizes mining impacts.	0	20,495 at Middle Knob. Minimizes mining impacts.	0	20,495 at Middle Knob. Minimizes mining impacts.	Unk.
Red Rock poppy	All occupied habitat	50	All occupied habitat	Minimal	All occupied habitat	50	All occupied habitat	50	All occupied habitat	50	All occupied habitat	50	Most habitat	Unk.
Red Rock tarplant	All occupied habitat	50	All occupied habitat	Minimal	All occupied habitat	50	All occupied habitat	50	All occupied habitat	50	All occupied habitat	50	Most habitat	Unk.
Salt Springs checkerbloom	All of single known site	0	0	Unk.	All of single known site	0	All of single known site	0	All of single known site	0	All of single known site	0	0	Unk.
San Diego horned lizard	15,954+	Unk.	4,393+	Unk.	15,954+	Unk.	15,954+	Unk.	15,954+	Unk.	15,954+	Unk.	0**	Unk.
Shockley's rock-cress	5,169	0	4,393	776	5,169	0	5,169	0	5,169	0	5,169	0	4,393 but no added management	776
Short-joint beavertail cactus	10,785	50	0	All	10,785	50	10,785	50	10,785	50	10,785	50	Existing SEAs and 1,590 scattered BLM parcels	0**
Southwestern pond turtle	All known sites (conditional at some)	Unk.	Selected sites	Unk.	All known sites (conditional at some)	Unk.	All known sites (conditional at some)	Unk.	All known sites (conditional at some)	Unk.	All known sites (conditional at some)	Unk.	Selected sites	Unk.
Southwestern willow flycatcher	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	Big Morongo ACEC	Unk.
Summer tanager	Mojave River sites (conditional)	Unk.	Selected sites	Unk.	Mojave River sites (conditional	Unk.	Mojave River sites (conditional	Unk.	Mojave River sites (conditional	Unk.	Mojave River sites (conditional	Unk.	Selected sites – see text	Unk.
Triple-ribbed milkvetch	All known sites	0	Sites on public land	Unk.	All known sites	0	All known sites	0	All known sites	0	All known sites	0	Sites on public land	Unk.

	A **PREFERRED**		B BLM ONLY*		C RECOVERY PLAN		D ENHANCED ECOSYSTEM		E ENHANCED RECREATION		F DISEASE AND RAVEN		G NO ACTION***	
	Conserved	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**	**Conserved**	**Take**
Vermilion flycatcher	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	Selected sites – see text	Unk.
Western snowy plover	All known sites	0	All known sites	0	All known sites	0	All known sites	0	All known sites	0	All known sites	0	Most known sites	Unk.
White-margined beardtongue	All known sites	50	Most known sites	Unk.	All known sites	50	All known sites	50	All known sites	50	All known sites	50	0	Minimal
Yellow-eared pocket mouse	Unk	Unk	Selected ACECs	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Selected ACECs	Unk
Yellow warbler	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	Selected sites – see text	Unk.
Western yellow-billed cuckoo	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	All sites (conditional)	0	Unk.	Unk.
Yellow-breasted chat	Mojave River sites (conditional) 10,785 (Big Rock Creek)	0	Mojave River sites (conditional)	0	Mojave River sites (conditional) 10,785 (Big Rock Creek))	0	Mojave River sites (conditional) 10,785 (Big Rock Creek)	0	Mojave River sites (conditional) 10,785 (Big Rock Creek)	0	Mojave River sites (conditional) 10,785 (Big Rock Creek)	0	Selected sites – see text	Unk.

See also Table 2-11. Unk. = Unknown.

* Acreages are for BLM managed lands only
** Los Angeles County may expand its SEA boundaries, providing some conservation for this species.
*** See text for potential conservation of the No Action Alternative. Continued review of projects under CEQA, by BLM in Category 1 habitat, and by FWS in occupied and critical habitat will result in some conservation by provision of compensation lands or set-asides.

CHAPTER ONE
INTRODUCTION

1.1 OVERVIEW

The West Mojave Plan (Plan) is a habitat conservation plan and federal land use plan amendment that (1) presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel (MGS) and over 100 other sensitive plants and animals and the natural communities of which they are a part, and (2) provides a streamlined program for complying with the requirements of the California and federal Endangered Species Acts (CESA and FESA, respectively).

The Plan is being prepared through the collaborative effort of cities, counties, state and federal agencies having jurisdiction over lands within the region. The Plan will allow streamlined project permitting at the local level, equitable sharing of costs among participants, and shared stewardship of biotic resources. The collaborators include:

- **Local Jurisdictions:** The cities of Adelanto, Barstow, California City, Hesperia, Lancaster, Palmdale, Ridgecrest, Twentynine Palms, and Victorville, and the towns of Apple Valley and Yucca Valley; the Counties of Inyo, Kern, Los Angeles and San Bernardino; and the Indian Wells Valley Water District.
- **State of California:** The California Department of Fish and Game and California Department of Transportation (Caltrans)
- **Federal:** The Bureau of Land Management and the United States Fish and Wildlife Service.

These agencies and local jurisdictions are cooperating with a variety of non-governmental organizations, including businesses, environmental organizations, user groups and others with a stake in the future management of the planning area, to develop the West Mojave Plan. Over 100 non-governmental organizations (NGO) have participated in this process. Representatives of the agencies, jurisdictions and NGOs comprise the West Mojave ***Supergroup***.

1.1.1 Site Location and Description

The 9,357,929-acre planning area is located to the north of the Los Angeles metropolitan area (See Maps 1-1 and 1-2 and Table 1-1). The Plan's conservation program applies to both public and private lands within this area. These lands include 3,263,874 acres of BLM-administered public lands, 3,029,230 acres of private lands and 102,168 acres of lands administered by the State of California. The Plan will be consistent with the integrated natural resource management plans that have been adopted for 2,667,445 acres of military lands, and with programs being implemented on nearly 300,000 acres of lands within Joshua Tree National Park.

Table 1-1
Land Ownership in Planning Area

LAND OWNERSHIP	APPROXIMATE ACRES	APPROXIMATE PERCENTAGE
Private Landowners		32
Counties and Cities	3,029,230	
State of California	102,168	1
State Lands Commission	71,059	
Department of Parks and Recreation	27,166	
Department of Fish and Game	3,943	
Federal Government		
Department of the Interior	3,556,730	37
National Park Service	292,689	
Bureau of Indian Affairs	167	
Bureau of Land Management	3,263,874	
Forest Service	2,356	
Department of Defense	2,667,445	29
TOTAL	9,357,929	100

1.1.2 Environmental Impact Statement

The West Mojave Plan is a major federal action that has attracted a high level of public interest and participation. The Bureau of Land Management (BLM) would adopt the Plan through amendment of its California Desert Conservation Area (CDCA) Plan and approval of other actions called for by the West Mojave Plan. To comply with the National Environmental Policy Act, preparation of an environmental impact statement is necessary, and must be completed prior to a BLM decision to approve and adopt the Plan's conservation strategy.

This Environmental Impact Report and Statement (EIR/S) is intended to serve as BLM's NEPA compliance document for the West Mojave Plan and CDCA Plan Amendment. It is a broad-scope analysis of a proposed habitat conservation plan and six other alternatives, including the No Action Alternative. All subsequent environmental analyses for land-use proposals in the planning area could be tiered to the EIR/S.

A Notice Of Intent To Prepare A West Mojave Plan and Environmental Impact Statement was published in the Federal Register on December 5, 1991. This Notice announced the holding of public scoping meetings in January 1992. Meetings were held at the following locations: Ridgecrest (January 6, 1991), Barstow (January 7, 1991), Twentynine Palms (January 8, 1991), Bakersfield (January 9, 1991), Victorville (January 13, 1991), Lancaster (January 14, 1991), and Riverside (January 15, 1991). These meetings initiated the West Mojave planning process.

A federal *Revised Notice of Intent to Prepare West Mojave Plan and Environmental Impact Statement* was published in the Federal Register in May 2002. This notice announced the holding of seven additional NEPA scoping meetings. Those meetings were held at the following

locations: Palmdale (June 26, 2002), San Bernardino (June 27, 2002), Victorville (June 28, 2002), Ridgecrest (July 1, 2002), Lone Pine (July 2, 2002), Pasadena (July 9, 2002) and Yucca Valley (July 10, 2002). At these meetings the suggested conservation strategy developed by the West Mojave Supergroup and its task groups was discussed and comments accepted. Comments received during scoping area available for public review at the BLM's California Desert District Office, Moreno Valley, California.

1.1.3 Program Environmental Impact Report

The County of San Bernardino and the City of Barstow are acting as co-lead agencies under the California Environmental Quality Act (CEQA) and are responsible for preparation of the portions of the document that pertain to state environmental review procedures. Because local jurisdictions may adopt the plan by enacting ordinances and/or amending land use plans, compliance with CEQA is required under California regarding actions taken by state agencies or local governments.

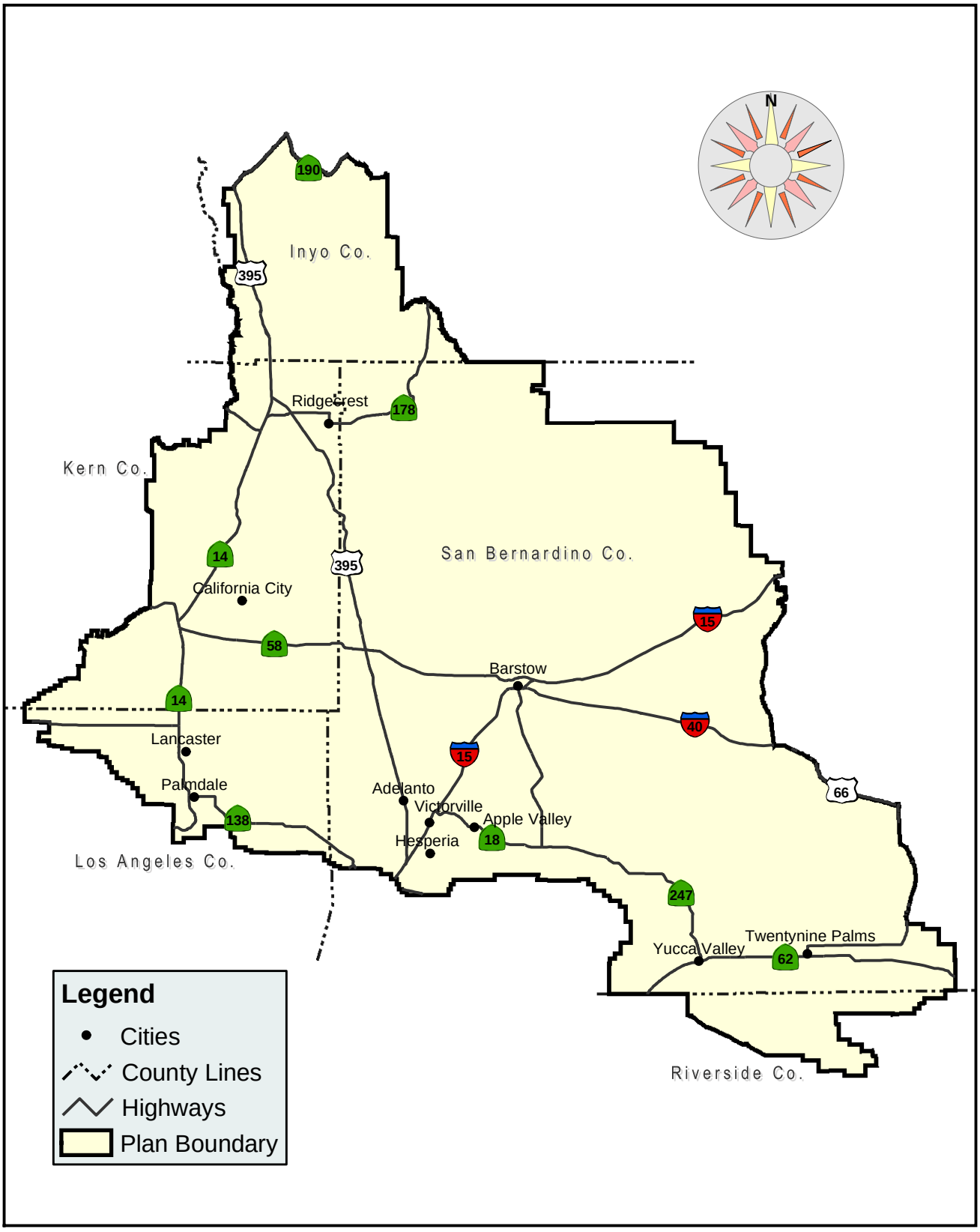
This EIR has been prepared in conformance with CEQA (California Public Resources Code 00 21000 et seq.), California CEQA Guidelines (California Code of Regulations, Title 14, 00 15000 et seq.), and the County and City local CEQA Guidelines. The EIR is intended to serve as an informational document for the public agency decision-makers and the general public regarding the characteristics and objectives of the proposed project, potential environmental impacts, recommended mitigation measures and reasonable alternatives to the project.

The EIR has been prepared as a Program EIR consistent with CEQA Guidelines Section 15168, which reads in part:

> (a) General. A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either:
> - Geographically,
> - As logical parts in the chain of contemplated actions,
> - In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or
> - As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

Various advantages of use of a program EIR and its use with later activities are discussed further in the Guidelines Section 15168 (b)(c). This EIR is intended to serve as the foundation environmental document for review of subsequent actions within the West Mojave planning area for all related state agency and local jurisdiction discretionary approvals required to implement the proposed Plan. A list of agencies and jurisdictions that may use the plan as well as the actions that may be taken by those entities is displayed in Table 1-2.

Planning Area

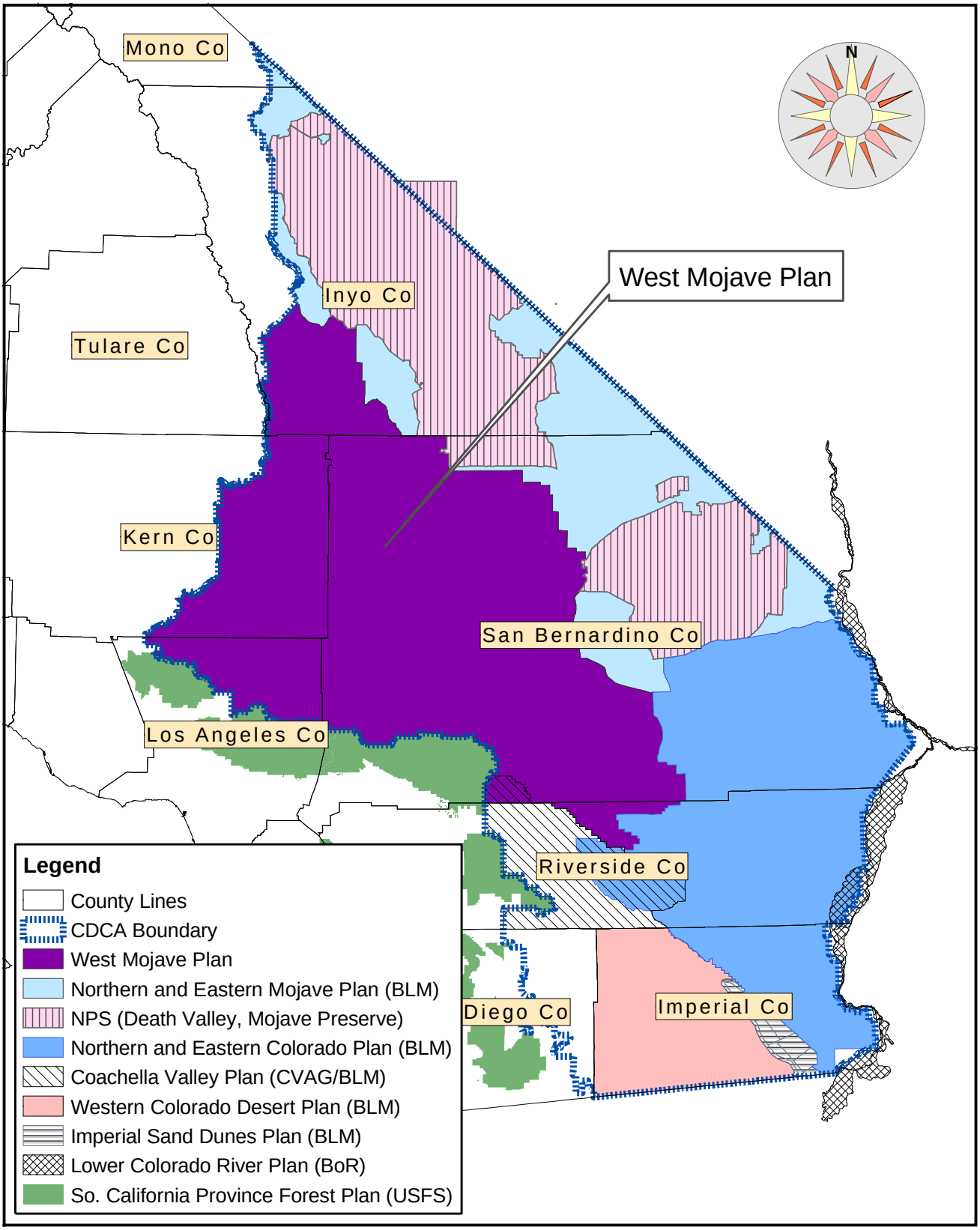


West Mojave Plan FEIR/S
Map 1-1

Scale: 1 : 1,750,000
0 10 20 30 Km
0 10 20 30 Miles

10/12/04

Regional Planning Efforts



West Mojave Plan FEIR/S
Map 1-2

Scale: 1 : 3,000,000
0 40 80 120 Km
0 20 40 60 Miles

10/1/04

Scope of the EIR: The scope of the EIR has been established through the various public meetings that have been held by the BLM over the last 10 years, but more extensively since 1997 when a re-structured planning effort was initiated by the participating agencies, led by the BLM. More recently, by the CEQA co-lead agencies conducted public scoping as required by CEQA to ensure that issues affecting the local jurisdictions and affected communities were addressed. The renewed planning effort by the BLM, as described in Sections 1.4.3 through 1.4.6, established a "Super Group" of interested stakeholders and a Steering Committee. In addition, Task Groups were convened that were open to any interest group or member of the public, which functioned as working groups to develop key elements of the plan. As described above, the BLM conducted formal scoping meetings pursuant to NEPA requirements during June and July of 2002. Subsequently, the CEQA co-lead agencies were identified and public scoping meetings as required by the CEQA Guidelines, were conducted to provide additional opportunities for the pubic to comment on the issues to be addressed in the EIR/S. The CEQA public scoping meetings were held during the public comment period for the Notice of Preparation of the EIR covering the plan. Written comments received in response to the NOP were also considered in establishing the scope of the EIR/S.

On December 27, 2002, a *Notice of Preparation of Environmental Impact Report for the West Mojave Plan on 6.4 Million Acres Located In California Desert Conservation Area* (NOP) was published by the San Bernardino County Land Use Services Department and the Kern County Planning Department. The NOP indicated that the counties would be coordinating the development of a programmatic EIR for the West Mojave Plan as co-lead agencies. The Notice of Preparation announced the holding of three CEQA scoping meetings. These meetings were held at the following locations: Bakersfield (January 9, 2003), Ridgecrest (January 10, 2003), and San Bernardino (January 16, 2003).

Due to additional interest in San Bernardino County's role as co-lead agency, on January 24, 2003 the County of Kern and the County of San Bernardino released an *Extension Of Comment Period And Addition Of Second Public Scoping Meeting In San Bernardino County*. The additional scoping meeting was held in Victorville on February 5, 2003.

A Revised NOP was issued on April 9, 2003, which indicated that the City of Barstow would join San Bernardino County as co-lead agency instead of Kern County. Following the announcement by Kern County on March 10, 2003, that it no longer would act in the capacity of CEQA co-lead agency, the City agreed to serve in that capacity to represent the various cities that may participate in the West Mojave Plan.

Appendix U presents a summary of the comments received on the NOP and during the public scoping meetings. The issues to be addressed and the areas of controversy surrounding the West Mojave Plan are listed in the Section 1.4.1 of this document.

1.1.4 Incidental Take Permits

To allow the incidental take of federally listed species on private lands, the United States Fish and Wildlife Service (USFWS) would issue incidental take permits to local jurisdictions under the authority of Section 10(a)(1)(B) of FESA (Section 10(a) permits). To allow incidental take of state-listed species, the California Department of Fish and Game (CDFG) would issue incidental take permits to local jurisdictions under the authority of Section 2081 of CESA (Section 2081 permits). The Plan would function as the "habitat conservation plan" (HCP) required by FESA as a precondition to the issuance of its Section 10(a) permit, and would indicate how the permit issuance criteria for both the Section 10(a) and Section 2081 permits would be met. The term of those permits would be thirty years.

A critical component of the Section 10(a) permit is the Implementing Agreement (IA). The IA defines the roles and obligations of each party (permitter and permittee(s)) and provides a common understanding of actions that will be undertaken to minimize and mitigate the effects on the subject listed and unlisted species and their habitats. The agreement legally binds the permittees to the requirements and responsibilities of a conservation plan and Section 10(a) permit. It may also assign the responsibility for planning, approving, and implementing the mitigation measures under the HCP.

The USFWS has established guidance on the preparation of HCPs and associated IAs in the form of the Habitat Conservation Planning Handbook (November 1996) and an Addendum (June 2000). While the Handbook is intended primarily as internal agency guidance, it has been used extensively by entities seeking an Incidental Take Permit. The Handbook identifies the specific components of an HCP that must be addressed to satisfy the criteria for issuance of an incidental take permit along with the key elements that an IA must contain.

Because many of the multi-species HCPs that have been prepared in California involve state listed species, the convention has been to use a single HCP document to address both state and federal requirements. Both the USFWS and the CDFG have recognized the advantages of utilizing one document to address both agencies' requirements for issuance of the respective incidental take permits.

The Draft EIR/S for the West Mojave Plan described both the proposed HCP and amendments to the BLM's CDCA Plan. The Final EIR/S has been revised in response to comments received from the public on the Draft EIR/S as well as from discussions with both USFWS and CDFG.

In order to satisfy the specific requirements of the USFWS and the CDFG with regards to the Section 10(a) and 2081 permit procedures, a final HCP and IA must be submitted along with formal applications by local government. This is a subsequent action that is contemplated as part of the program addressed in this EIR/S. The final HCP will reflect the selected alternative as adopted by the local government lead agencies. The final HCP will be a stand-alone document that incorporates the relevant sections from the EIR/S that meet USFWS and CDFG technical guidance to satisfy the submittal requirements for the incidental take permits. Any further

environmental review associated with incidental take permit procedures will comply with the requirements of NEPA and CEQA.

1.1.5 EIR/S Organization

The EIR/S is organized into the following parts:

- **Chapter One - Introduction** provides an overview of the Plan, the reasons for its preparation, applicable statutes, regulations, and policies, and the history of the planning process.
- **Chapter Two - Alternatives** describes the seven alternative conservation strategies examined in detail by this document. A tabular comparison of these alternatives is provided. This chapter also describes other suggested strategies that were discussed during the planning process but ultimately eliminated from detailed consideration by the EIR/S.
- **Chapter Three - Affected Environment** describes those aspects of the natural and human environment that are likely to be affected by the adoption of the alternatives described in Chapter 2. These include the region's biological, recreation and cultural resources, a social and economic profile of the western Mojave Desert, energy production and transmission, and a discussion of motorized vehicle access to public lands.
- **Chapter Four - Environmental Consequences** presents an analysis of the effects that adoption of each of the alternatives could have on the natural and human environment.
- **Chapter Five** addresses the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity, irreversible and irretrievable commitments of resources, growth inducing effects, energy consumption and conservation, environmental justice considerations, and effects found not to be significant. It includes references cited, a list of preparers and a table of acronyms.
- **Chapter Six** presents a summary of comments received during the scoping process.
- **Appendices** that include supporting technical materials and studies.

1.1.6 Use of EIR/S by Agencies and Jurisdictions

The EIR/S would be used by many of the collaborating agencies and local jurisdictions in making decisions concerning the West Mojave Plan. These entities are listed in Table 1-2 along with the possible uses of the EIR. Public agencies (i.e., Responsible and Trustee Agencies) that may use this EIR in their decision-making or permit processing, will consider the information in this EIR along with other information that may be presented during the CEQA process. The role of a state or local public entity acting as a responsible agency under CEQA is described in Section 15096 of the CEQA Guidelines.

Table 1-2
Agencies and Jurisdictions Expected to use EIR/S During Decision-making Process

AGENCY/JURISDICTION	STATUS	POTENTIAL USE(S) OF THE EIR/S
Bureau of Land Management	NEPA Lead Agency	CDCA Amendment
San Bernardino County	CEQA Co-Lead Agency NEPA Cooperating Agency	Plan adoption and other implementing actions
Kern County	CEQA Responsible Agency NEPA Cooperating Agency	Plan adoption and other implementing actions
Inyo County	CEQA Responsible Agency	Plan adoption and other implementing actions
Los Angeles County	CEQA Responsible Agency	Plan adoption and other implementing actions
Fish and Wildlife Service	NEPA Cooperating Agency	Section 7 Consultation & Section 10a(1B) Permit
California Department of Fish and Game	CEQA Responsible and Trustee Agency	Incidental Take Permit per Section 2081
Caltrans	CEQA Responsible Agency	Plan adoption and other implementing actions
Adelanto	CEQA Responsible Agency	Plan adoption and other implementing actions
Apple Valley	CEQA Responsible Agency	Plan adoption and other implementing actions
Barstow	CEQA Co-Lead Agency	Plan adoption and other implementing actions
California City	CEQA Responsible Agency	Plan adoption and other implementing actions
Hesperia	CEQA Responsible Agency	Plan adoption and other implementing actions
Lancaster	CEQA Responsible Agency	Plan adoption and other implementing actions
Palmdale	CEQA Responsible Agency	Plan adoption and other implementing actions
Ridgecrest	CEQA Responsible Agency	Plan adoption and other implementing actions
Twentynine Palms	CEQA Responsible Agency	Plan adoption and other implementing actions
Victorville	CEQA Responsible Agency	Plan adoption and other implementing actions
Yucca Valley	CEQA Responsible Agency	Plan adoption and other implementing actions
Indian Wells Valley Water District	CEQA Responsible Agency	Adopt Plan

Per CEQA, the term "responsible agency" includes all public agencies other than the lead agency having discretionary approval power over the project. Responsible Agency means a public agency that proposes to carry out or approve a project, for which a lead agency is preparing or has prepared an EIR or negative declaration. Trustee Agency means a state agency having jurisdiction by law over natural resources affected by the project that are held in trust for the people of California. Per NEPA, "cooperating agency" means an agency (including, by agreement, a local agency) having jurisdiction by law or special expertise with respect to any environmental impact involved in a major federal action.

1.1.7 Modifications to be Found in the Final EIR/S

Responses to comments received on the Draft EIR/S are presented in Chapter 6. Many of the comments requested modifications or clarifications of either the West Mojave Plan's conservation strategy or the environmental analysis presented in the Draft EIR/S. Where the text of the Final EIR/S differs from that presented in the Draft EIR/S, a vertical black line in the left-hand margin indicates the location of the modified or clarified text. A summary of these modifications follows. Because most of the changes consisted of minor modifications, only a selection is presented below.

- Conservation Area adjustments
    - Pisgah Crater (western portion dropped, expansion to northeast)
    - North Edwards (some lands excluded)
    - Alkali Mariposa Lily (realigned to capture the Amargosa Creek drainage, increase size and drop interim conservation areas)
- Biological Transition Areas eliminated (portions added to DWMA)
- New biological objectives for several species
- Tortoise Survey Zones – minor modifications
- Fee Zones – minor modifications
- BLM DWMA Multiple Use Class M Lands changed to Class L
- Revised Monitoring and Adaptive Management Table
- Additional discussion of cumulative impacts
- Appendix C.1 (Implementation Tasks, Costs and Priorities) Revision
- Compact Disk Additions – species accounts, vegetation map, Draft EIR/S comment letters
- BLM Route Designation
    - Adoption of Competitive "C" Routes Northwest of Spangler Open Area
    - Route Openings in Summit Range
    - Route closures in Fremont Kramer Tortoise DWMA to Offset "C" Routes
    - Selected closures in small conservation areas
    - Revised Juniper Subregion route network
    - "No Action" route network is BLM June 30, 2003 Decision Record

1.2 PURPOSE AND NEED

The West Mojave planning area is rich in biological diversity because of its varied vegetation communities and landforms and because of its location adjacent to the Transverse Ranges, the Sierra Nevada, the Colorado Desert and the Great Basin. With its proximity to the rapidly growing cities of the Los Angeles basin, the West Mojave planning area is subject to increasing demand for community development, recreation and resource utilization. One result is an increasing loss of species habitat.

Loss or degradation of species habitat along and beyond the urban interface can lead to the listing of plants and animals as threatened or endangered by the USFWS and/or the CDFG.

USFWS has listed thirteen western Mojave species; CDFG has listed eleven; six are listed by both agencies (see Table 1-3). It was the listing of the desert tortoise by USFWS and CDFG in 1990 and 1989, respectively, that was the impetus for the preparation of the West Mojave Plan. Several dozen other plants and animals are at risk of listing in the next few decades, unless proactive conservation steps are taken.

Table 1-3
Special Status Species Summary

CATEGORY	LISTED	PROPOSED	OTHER	TOTAL
Fish	1	0	0	1
Amphibians	3	0	0	3
Reptiles	1	0	4	5
Birds	7	0	30	37
Mammals	1	0	13	14
Plants	8	0	55	63
TOTAL	21	0	102	123

Because species are interdependent, the steps necessary to conserve species cannot be taken in isolation. Species exist naturally as members of a network of varying connections to other species and their habitats. The inherent interdependence of species and ecosystems makes it difficult to protect any given plant or animal without taking into account factors that may apply to many species. Both species and natural communities must be considered.

Once a species is listed, federal agencies such as the BLM are required to ensure that declining populations *recover* to levels sufficient to ensure their long-term survival. Any new development project on public lands that may affect a listed species can proceed only after the agency "consults" with USFWS and receives a biological opinion finding that the project would not jeopardize the continued existence of the species in the wild. Once recovery is attained, the species can be delisted.

CESA and FESA impose special requirements on private lands as well. In most cases, persons may not *take* a species listed as threatened or endangered. This protection extends to the listed species' habitat. Take is permitted, however, if a landowner obtains an incidental take permit. Such permits are required from the agency that listed the species (USFWS and/or CDFG). Obtaining these permits can be a time-consuming and expensive process. Permitting delays will only increase if unattended biological problems lead to more species being listed.

This situation has led to two unmet needs, for: (1) a regional biological strategy to conserve plant and animal species and their habitats and prevent future listings; and (2) an efficient, equitable and cost-effective process for complying with threatened and endangered species laws.

The purpose of the West Mojave Plan is to satisfy both of these needs. The Plan includes a conservation strategy which would allow state and federal land management agencies to implement their mandates under FESA and CESA to recover listed species and their habitats,

and to conserve natural communities. At the same time, it proposes a streamlined program which would significantly reduce the time and expense involved in obtaining biological opinions and incidental take permits.

1.3 RELATIONSHIP BETWEEN THE WEST MOJAVE PLAN AND THE EXPANSION OF FORT IRWIN

The National Training Center at Fort Irwin provides a battlefield environment for training brigade-sized units of the United States Army. It is the Department of the Army's premier combat training center. Due to changes in technology and tactics, the Army has sought to include additional lands within the boundaries of the installation to enable it to conduct training that meets the future combat needs of the Army. To this end, the Army has been examining possible base expansion scenarios for more than a decade.

In December 1996 the BLM, as lead federal agency due to its role as administrator of public lands likely to be included in any base expansion, published a draft Environmental Impact Statement titled "Army's Land Acquisition Project for the National Training Center, Fort Irwin California, and Proposed Amendment to the California Desert Conservation Area Plan." The DEIS examined several potential alternative base expansion scenarios, and was released for a 90-day public review.

In December 2001, Congress enacted the Fort Irwin Military Land Withdrawal Act. This statute withdrew approximately 110,000 acres of public lands adjacent to Fort Irwin and transferred jurisdiction from BLM to the Army. While the purpose of the transfer was to provide the lands necessary for expanded training at Fort Irwin, the Army was precluded from using the lands for that purpose until it completed the steps necessary to comply with NEPA and the federal endangered species act. Completion of these steps will require the preparation of a supplemental draft EIS (SDEIS) and a final EIS, and a Section 7 consultation with USFWS. Fort Irwin has assumed federal lead responsibility for preparation of the base expansion SDEIS, because the critical NEPA question has become the use of these lands by Army rather than their transfer to Army. The supplemental draft EIS was published in April 2004.

The Fort Irwin Military Land Withdrawal Act requires that "the analysis [of the Fort Irwin base expansion] shall be coordinated, to the extent practicable and appropriate, with the review of the West Mojave Coordinated Management Plan that, as of the date of the enactment of this Act, is being undertaken by the Bureau of Land Management." Accordingly, the preparation of this final EIR/S has been coordinated with the Army's base expansion planning team so that the information presented in each document is consistent and the potential and cumulative impacts of the projects are adequately addressed.

1.4 HISTORY OF THE PLANNING PROCESS

1.4.1 Planning Issues

The issues to be addressed by the West Mojave Plan have been identified through a ten-year public involvement process that began with a first round of scoping meetings (held in January 1992), increasingly frequent Supergroup meetings, several dozen meetings of task groups established by the Supergroup between December 1999 and May 2002, a final round of NEPA scoping meetings held in June and July 2002, and most recently concluding with CEQA scoping meetings held in January and February 2003 and an opportunity to comment on the Notice of Preparation for the EIR. A summary of the most important issues is presented in Table 1-4.

Table 1-4
Planning Issues

ISSUE	DISCUSSION
Desert Tortoise	Identify conservation areas and adopt conservation strategies that minimize take on private land and recover populations on public land.
Mohave Ground Squirrel	Identify conservation areas and adopt conservation strategies that minimize take on private land and recover populations on public land.
Other Listed and Sensitive Species	Adopt conservation strategies that minimize take on private land, recover populations on public land, and prevent future listings of unlisted species.
Streamlined Endangered Species Act Compliance	Develop a streamlined process that would allow applicants for city, county, state and federal permits and authorizations to accelerate existing costly and time-consuming permit issuance procedures.
Motorized Vehicle Access Network for Public Lands	Provide appropriate motorized vehicle access to public lands for commercial, recreational and other purposes in a manner that is compatible with species conservation.
Expansion of Fort Irwin	Develop conservation strategies that will be effective even if expanded military training programs are implemented on lands transferred in 2001 to Fort Irwin.
Standards and Guidelines for Public Lands	Develop rangeland standards for managing ecosystem health and guidelines for managing domestic livestock uses.
Regional Economic Growth	Promote economic growth within the planning area.

1.4.2 1992 Memorandum of Understanding

The West Mojave planning process was formally initiated in 1992 by the execution of a *Memorandum of Understanding By and Between the U.S. Bureau of Land Management and the Undersigned Participating Agencies* (MOU; see Appendix A). Recognizing that CESA and FESA direct the parties to "protect certain species of concern and their habitats from adverse effects resulting from public and private development and actions" and acknowledging that "the private sector cannot now be assured that project review will be timely or that mitigation, compensation, and other requirements will be consistent among the participating agencies" (MOU, page 1), the MOU identified the following "Purposes of the Plan":

1. Protection of Species of Concern: To conserve and protect species of concern and the ecosystem on which they depend within the western Mojave Desert.

2. Provide Equity in Regulation: To provide a comprehensive means to coordinate and standardize mitigation and compensation requirements so that public and private actions will be regulated equally and consistently, reducing delays, expenses, and regulatory duplication. It is intended that the Plan will eliminate uncertainty in developing private projects and will prescribe a system to ensure that the costs of compensation/mitigation are applied equitably to all agencies and parties.

3. Reduce Cumulative Impacts: To prescribe mitigation measures for private development and agency actions to lessen or avoid cumulative impacts to the species of concern and eliminate, whenever possible, case-by-case review of impacts of projects when consistent with the mitigation and compensation requirements prescribed by the Plan. [MOU, page 2]

The MOU provided that the Plan "will function as the Habitat Conservation Plan for the [incidental take] permit applications" by participating local governments.

1.4.3 1997 Equitable Precepts

In mid-1997 the participating agencies, led by the BLM, restructured the planning process to ensure (1) greater public participation in developing a conservation strategy that would meet the needs of the participants, and (2) collection and use of the best science reasonably available, including recent field surveys. As a first step in this restructuring, on September 10, 1997, the West Mojave Supergroup adopted Equitable Precepts to guide the preparation of the West Mojave Plan. These consisted of the Mission Statement and Principles set forth below:

Mission Statement

The West Mojave Plan will provide an improved and streamlined process which minimizes the need for individual consultations with the United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) while providing better science for species conservation.

The [West Mojave] Plan will allow projects to be approved and signed-off rapidly. Project proponents will know the mitigation measures that will be required of them before the project is presented to the local government or, in the case of public land, presented to the state or federal agency.

Principles

1. The ultimate goal of the [West Mojave] Plan will be based on specified measures to enable project proponents to comply with the requirements of CESA and FESA.

2. The [West Mojave] Plan will be equitable, predictable and compatible with local, state and federal agency permitting procedures so as to be easily administered.

3. The mitigation strategy will be responsive to the needs and unique characteristics of the many diverse industries and activities in the program area on both public and private land while allowing compatible growth.

4. Project proponents shall have a choice of utilizing the conservation program or working

directly with the CDFG or USFWS to address Endangered Species Act compliance.

5. The [West Mojave] Plan will incorporate realistic fiscal considerations, with identified sources, i.e. federal, state, local, public and private.

6. The [West Mojave] Plan will ensure that no one group of desert users will be singled out to disproportionately bear the burden of the [West Mojave] Plan implementation.

7. The [West Mojave] Plan will have the flexibility to respond to future legislative, regulatory and judicial requirements.

1.4.4 Data Base

The West Mojave Plan is based upon the best science reasonably available. To meet this standard, data were reviewed to identify pertinent life history information, assess threats to covered species, and provide the most appropriate management prescriptions to address those threats. Where existing information was considered incomplete, species experts were consulted to fill in the data gaps. The planning team consulted 8 botanists, 13 ornithologists, 3 mammalogists, and 4 herpetologists to ensure that data for those taxa were the most complete and accurate information available. For the desert tortoise, this meant collecting and digitizing existing transect data and performing new surveys over approximately 3,615 square miles that had not been recently surveyed. Previous planning for Mohave ground squirrel conservation (Remple 1991, Clark 1993) and recent studies (Leitner and Leitner 1989, 1990, 1996a, 1996b; Leitner et al. 1995, 1997) were important for designing reserves and determining appropriate management prescriptions. New field surveys were conducted in the spring of 2001 for sensitive birds and plants.[1]

Biological data for the Plan were obtained from a variety of sources. The data were compiled, analyzed, and stored to support various components of the Plan preparation and implementation process. The sources of data include known location information for covered species and habitats. These data were complied from various sources, including the following:

- California Natural Diversity Data Base (NDDB) records. Data from the NDDB were from 1999 and have been updated periodically since then.
- CDFG, BLM, Army and USFWS data.
- Data collected from biologists knowledgeable about the plan area and/or a given species. This included records from consultants and non-profit organizations (e.g. California Native Plant Society, Point Reyes Bird Observatory, Mojave Desert Bird Club).
- Data from individual biologists obtained during planning meetings.
- Location data from voucher specimens held in museums and herbaria.
- Published records and species distribution information from peer-reviewed journal articles, where information on species has been described at an appropriate scale.
- Presence-absence tortoise survey data resulting from studies required by county and local government since the 1990 listing.

1 See Chapter 3 for a more detailed discussion of these data.

Dr. William Boarman prepared a survey of the threats adversely affecting the desert tortoise for the West Mojave planning effort. This was the peer-reviewed *Threats to the Desert Tortoise: A Critical Review of the Scientific Literature* (attached as Appendix J). Dr. Boarman's threats analysis was instrumental in identifying potential conservation measures to address each known threat adversely affecting the tortoise.

Species Accounts: For each plant or animal addressed by the Plan, a *Species Account* was prepared. A wildlife biologist or botanist possessing recognized expertise concerning the species in question authored each of these documents. The accounts described the general status, habitat, life history, distribution, biological goals, and threats faced by each species, as well as a detailed bibliography. All species accounts were peer reviewed. GIS maps were created for each species showing known occurrences and general distribution, and all cited papers and reports were obtained and copies filed.

Current Management Situation: In March 1999, a report was published detailing the *Current Management Situation of Special Status Species in the West Mojave Planning Area* (CMS). This report identified existing policies and management actions being applied by each of the participating agencies with respect to each of the species being addressed by the Plan.

Geographic Information System Database: A digital library of over 300 geographic data layers was assembled, displaying biological, political, topographic and other critical planning information.

Motorized Vehicle Access Network Field Survey: Between September 2001 and March 2002, thirteen field crews inventoried nearly 8,000 miles of motorized vehicle access routes within the western Mojave Desert. Both four wheel drive and motorcycle crews participated in the survey. Routes were recorded using global positioning system technology. The nature of the route (graded gravel, good dirt, motorcycle trail) was recorded, and nearly two-dozen types of pertinent desert features mapped (including campsites, mines, trailheads, and water sources). This information was transferred into the planning team's digital GIS library. In addition, data collected by BLM field survey crews in 1985 and 1987, and during the preparation of BLM management plans for areas of critical environmental concern between 1980 and the late 1990s, was digitized and stored in the GIS database. This data was supplemented by data digitally collected from aerial photography taken in 1995 and 1996, and covering most public lands within the planning area.

In response the many comments on the Juniper subregion, an inventory of existing routes of travel was performed in October 2003. Using this new database, comment clarification letters and comments at three meetings held to discuss this subregion, BLM revised the route designations in the Juniper subregion to provide a more accurate and effective transportation network.

Development of the List of Species Addressed by the Plan: The list of species to be addressed by the Plan was based on wildlife agency compilations of threatened, endangered, vulnerable, and declining species. Species addressed by the plan include both those for which

private land incidental take permit coverage would be sought ("covered species"), and those for which a public land conservation strategy would be adopted and implemented by the BLM through its California Desert Conservation Area Plan.

Criteria for inclusion on the list included the following:

- Species listed as threatened or endangered by the state and federal governments.
- Species proposed for listing by the federal government.
- Species designated as candidates for listing by the state and federal government.
- "Species of Special Concern" on the Department's "Special Animals" list.
- Plants included on the Department's "Special Plants" list.
- Plants and animals on the BLM "sensitive species" list.
- Plants included on List 1B or List 2 of the California Native Plant Society's *Inventory of Rare and Endangered Plants of California*.

The Supergroup approved the list of 98 plant and animal species to be addressed by the Plan in 1996. The USGS then contracted with experts on each species, who prepared the species accounts for use in development of the Plan.

On May 5, 1997 and April 3, 1998, local botanists submitted a list of plants and animals seen at Middle Knob and in surrounding areas. These records were examined, and those species found within the West Mojave Plan area were included. On September 1 1998, the California Native Plan Society submitted a list of fourteen rare plants within the West Mojave and requested their addition to the Plan list. This list was reviewed and species with sufficient information were added to the list of species to be addressed by the West Mojave Plan.

The *Current Management Situation of Special Status Species in the West Mojave Planning Area* was published March 31, 1999. This document detailed existing conservation measures in place for each jurisdiction for each of the original 98 species.

Using the species accounts and the *Current Management Situation*, West Mojave Plan biologists met with the wildlife agencies to prepare an evaluation. The evaluation team reviewed all species on the Supergroup list along with the proposed additions. Fifty-eight species were dropped from the list and were not further addressed by the Plan because of insufficient data, because they were being separately addressed by other Habitat Conservation Plans and Biological Opinions already in place or underway, because they were too common, or for other reasons. The Evaluation Report of September 22, 1998 discussed the reasons for retention or deletion of species from the covered species list.

Changes were made in the federal, state and CNPS lists between 1998 and now. The *Inventory of Rare and Endangered Plans of California* was revised in August 2001, and plants that were added to List 1B and List 2 were added to the West Mojave list if sufficient information was available to prepare conservation plans. Plants that were deleted from the earlier edition were deleted from the West Mojave list. Similarly, CDFG's list of "Special Animals" changed over time, and these changes were incorporated into the West Mojave list.

The final list of species was completed on June 26, 2002. This list was provided to members of the Task Groups and Supergroup and all interested stakeholders. As this list was reviewed by the local jurisdictions, a few additional changes were made, such as deletion of Kelso Creek monkeyflower, mountain plover and Bendire's thrasher from the request for incidental take coverage.

In response to comments on the West Mojave Plan, other species were deleted from the request for incidental take coverage. Concerns expressed by CDFG resulted in deletion of nine species because of insufficient information or for other reasons. These are bighorn sheep, spotted bat, pallid bat, long-legged myotis, Western mastiff bat, golden eagle, Panamint alligator lizard, Reveal's buckwheat, and flax-like monardella.

The Plan now lists 49 species as covered species proposed for receipt of incidental take permits under the Section 10(a) and 2081 permits. Wildlife agency review of this document and the Implementing Agreement may result in the exclusion of other species from permit coverage. The list of all species addressed by the Plan, along with the scientific names, is included as Appendix Y.

1.4.5 Biological Evaluation

Following the assembly of the database, a "Biological Evaluation" was conducted in a series of meetings between March 1998 and June 2000. Participants included biologists from the West Mojave planning team, USFWS, CDFG and invited experts. Biologists evaluated the effectiveness of current management, identified management shortfalls, and suggested measures to address those shortfalls. Evaluation meetings were structured around the following seven questions:

- How important is the planning area to the species as a whole?
- Does the planning area contain essential habitat for the species to complete its life history?
- Why was the species placed on the special status list? What is the concern?
- Is current management adequate to protect the species?
- Is the geographical size and location of conservation areas adequate to protect the species? If not, what additional areas need to be committed to assure protection of the species?
- Is the management of proposed conservation areas adequate to protect the species? If not, what management improvements could be implemented to assure protection of the species within the target conservation areas?
- Is management of lands outside conservation areas adequate to protect the species? If not, what management improvements could be implemented to assure protection of the species outside conservation areas?

An Evaluation Report addressing the Desert Tortoise, mammals, birds, fish, reptiles and amphibians was published on September 22, 1999 and distributed to the Supergroup. A Mohave

ground squirrel Evaluation Report was completed and distributed on September 14, 2000. Finally, an Evaluation Report addressing rare plants was completed and distributed on October 15, 2001.

1.4.6 Task Groups Develop the Conservation Strategy

In November 1999, the West Mojave Supergroup established four task groups to develop components of the West Mojave Plan. Task group members were not appointed; rather, any organization or individual could attend and participate in a task group meeting. All meetings were open to the public and, at one time or another, a representative of nearly every Supergroup entity attended a task group session. Task groups were not established to make decisions for the participating agencies and jurisdictions, nor were they intended to function as formal appointed advisory bodies. Rather, the task groups provided an informal public forum to allow collaborative interagency and stakeholder planning and information gathering, as an extension of public scoping efforts. These Task Groups included:

- Task Group 1, Conservation Strategy
- Task Group 2, Motorized Vehicle Access Network
- Task Group 3, Regulatory Issues
- Task Group 4, Plan Implementation

A 14-member Steering Committee was established by the Supergroup to resolve deadlocks and provide guidance to the task groups.

Task groups met 47 times between December 1999 and May 2002. On two occasions task groups deadlocked on issues. Six meetings of the Steering Committee successfully resolved these deadlocks.

Numerous issues were too complex or controversial to resolve at a single task group meeting. In such cases, subcommittees composed of volunteers were asked to discuss the issue and return with a proposed solution at the following task group meeting. Task Group 1 formed over a dozen subcommittees that dealt with issues as diverse as the expensive tortoise fencing program, desert recreation, mitigation fees and compensation structure, and "best management practices" to apply as standard take-avoidance measures. To assist Task Group 2 and the route designation process, two subcommittees were formed: a field survey advisory group and a route designation technical committee. A subcommittee might meet once or, once established, be recalled on numerous occasions to address difficult issues. Over 50 subcommittee meetings were held in addition to task group meetings.

As the task group process evolved, certain issues would emerge that would result in considerable public interest or controversy, including the design of the motorized vehicle access network and the role of equestrians in desert planning. When this occurred, public information meetings were held throughout the desert on an irregular basis. About a dozen of these meetings, attended by up to 250 persons, were held during the task group process. Many persons who first became involved through these meetings later joined one or another of the task groups.

1.4.7 Public Review of DEIR/S

A Draft EIR/S was released for a 90-day public review that began on June 13, 2003 and ended on September 12, 2003. Public hearings were held in Victorville (July 15, 2003), Lone Pine (July 16, 2003), Ridgecrest (July 17, 2003), Redlands (July 22, 2003), Yucca Valley (July 23, 2003), Palmdale (July 24, 2003) and Barstow (July 30, 2003). Responses to written and oral comments received from the public are presented in Chapter 6 of this Final EIR/S. Chapters 1 through 5, as well as the appendices, include changes made in response to those comments.

1.5 NECESSARY DECISIONS AND APPROVALS

1.5.1 Agency and Jurisdiction Decisions and Approvals

Bureau of Land Management Implementation of the West Mojave Plan on public lands would require approval of the Plan by the BLM's California State Director through a Record of Decision (ROD). This approval process would include the amendment of the CDCA Plan to ensure consistency with the provisions of the West Mojave Plan. By executing the ROD, BLM will adopt both the West Mojave Plan and any necessary CDCA Plan amendments. The amendments that would be necessary to implement each alternative are listed in Chapter 2, beginning with Section 2.2.10, the amendments associated with Alternative A.

The West Mojave Plan Record of Decision would also amend 25 existing Area of Critical Environmental Concern (ACEC) management plans, and would serve as the ACEC management plan for 14 newly-designated ACECs. These new and revised ACEC management plans may be found in Appendix D.

The BLM Record of Decision will be issued after the final environmental impact report and statement is published, and after any protests are submitted and resolved.

Cities and Counties: Adoption of the West Mojave Plan by cities and counties would not require amendments to local jurisdiction general plan land use elements. Modifications of city and county conservation elements may occur, however, to provide reference to the West Mojave Plan and associated conservation strategies. Certain jurisdictions may also amend their zoning and development ordinances to provide consistency with the HCP's conservation strategies. Local jurisdictions adopting the West Mojave Plan would need to adopt a fee ordinance in order to implement the mitigation fee described in Chapter 2.

Measures applicable to each jurisdiction are identified in Appendix B.

United States Fish and Wildlife Service: For the West Mojave Plan's streamlined FESA compliance procedures to be implemented, USFWS would have to issue an incidental take permit under Section 10(a) of FESA to the participating cities and counties, and to Caltrans. This could include the issuance of "no surprises" assurances for unlisted species. A biological

opinion prepared pursuant to Section 7 of FESA would have to be issued to the BLM and any other participating federal agencies.

California Department of Fish and Game: CDFG would issue an incidental take permit under Section 2081 of CESA to the participating cities, counties and Caltrans.

1.5.2 Relationship to Statutes, Regulations and Policies

All decisions and approvals would be consistent with applicable federal and California statutes, regulations and policies, including but not limited to the following:

- Federal Endangered Species Act
- California Endangered Species Act
- National Environmental Policy Act
- California Environmental Quality Act
- California Fish and Game Code
- California Planning Statutes
- Federal Land Policy and Management Act
- National Historic Preservation Act
- California Desert Protection Act
- Clean Water Act
- Clean Air Act
- Wilderness Act
- Taylor Grazing Act
- Sikes Act
- Mining and Minerals Policy, and National Materials and Minerals Research and Development Acts
- Mining, Mineral Leasing, Material Disposal and Reclamation Acts
- Federal Executive Orders and Congressional Mandates

This plan recognizes that unforeseen national security measures may require immediate compliance by utilities to operate or construct features designed to secure and protect energy and communication systems. Should the Department of Homeland Security, Federal Energy Commission, California Energy Commission or California Public Utility Commission proclaim the necessity of such measures, utilities will be allowed to implement said measures. Appropriate mitigation and plan compliance shall be sought "after the fact." Where variance to the Plan is required, parties shall negotiate to accomplish the spirit of the Plan.

1.5.3 Relationship to Other Regional Plans

Southern California and southern Nevada are the sites of a number of important regional planning efforts, many of which are addressing the same issues that are being considered by the West Mojave Plan (see Map 1-2). These include regional habitat conservation plans, natural community conservation plans and federal land use plans and amendments. In fact, most of the

land surface between Las Vegas, Nevada and San Diego, California lies within the scope of an ecosystem-planning program.

The following is a brief summary of major planning efforts being undertaken immediately adjacent to or within the West Mojave planning area.

Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP): The lead for this plan is the Coachella Valley Association of Governments. The planning area includes most of the urban and urbanizing area of the Coachella Valley as well as the Santa Rosa Mountains, and portions of Joshua Tree National Park, all within Riverside County. This MSHCP lies adjacent to and southeast of the West Mojave planning area. The plan addresses issues of urbanization on private and state lands. As part of this planning effort, BLM has prepared a separate CDCA plan amendment applicable to federal lands within the Coachella Valley plan area. Both CVMSHCP and the West Mojave Plan are developing conservation strategies for species whose range overlaps both planning areas. These include the management of the Little San Bernardino Mountains gilia, the triple-ribbed milkvetch, the Whitewater and Big Morongo Canyon ACECs and, to a minor degree, the desert tortoise. A Record of Decision for the BLM Coachella Valley CDCA Plan Amendments was signed in December 2002.

Northern and Eastern Mojave Plan (NEMO): The BLM's NEMO plan addressed recovery of the desert tortoise and management of a few additional species of concern on public lands. NEMO addressed only BLM programs, and only the BLM's CDCA Plan was amended; private lands and other federal agencies were not affected. The NEMO planning area lies to the northeast of the western Mojave Desert, in the area that generally lies between Death Valley National Park and the Mojave National Preserve. The most important cross-boundary issues that affect both NEMO and West Mojave involve the management of a small Mojave ground squirrel population northeast of Trona, and ensuring that CDCA Plan Amendments are consistent. A Record of Decision for NEMO was signed in December 2002.

Northern and Eastern Colorado Plan (NECO): The NECO plan, like NEMO, primarily concerned the management of BLM lands located to the east and southeast of the West Mojave planning area, although a broader-based planning program was conducted in collaboration with the Marine Corps, the National Park Service and local governments. NECO's decisions affected federal lands only. The most important cross-boundary issues that affect both NEMO and West Mojave involve the management of the Mojave fringe toed lizard (two thirds of the known range lies within the West Mojave, and one third within NECO), as well as ensuring that CDCA Plan Amendments are consistent. A Record of Decision for NECO was signed in December 2002.

Southern California Province Forest Plan: This plan is being prepared by four National Forests located in Southern California, including the Angelus and San Bernardino National Forests, which are adjacent to and south of the West Mojave planning area. Decisions reached by the Southern California Province Plan will affect National Forest lands only. The most important cross-boundary issues that affect both the Forest Service planning efforts and the West Mojave Plan involve the implementation of the Carbonate Habitat Management Strategy;

developing conservation programs for the San Diego horned lizard, the short-joint beavertail cactus, the gray vireo and the arroyo toad; and the coordination of motorized vehicle access networks.

Military Integrated Resource Management Plans (INRMPs): Each of the five military bases located within the West Mojave planning area has prepared, or is preparing, an INRMP to guide the management of natural resources on each base. The INRMPs affect military lands only. The most important cross-boundary issues that affect both the West Mojave Plan and INRMPs follow: (1) For Edwards Air Force Base, management of the desert tortoise, Mohave ground squirrel, alkali mariposa lily, desert cymopterus and Barstow woolly sunflower; (2) for China Lake Naval Air Weapons Station, the management of the desert tortoise, Mohave ground squirrel, Townsend's big-eared bat, bighorn sheep, and Inyo California towhee; (3) for Fort Irwin, management of desert tortoise and the Lane Mountain milkvetch; (4) for the Marine Corps Air Ground Combat Center at Twentynine Palms, the management of the desert tortoise, California leaf-nosed bat, bighorn sheep, Mojave fringe-toed lizard and white-margined beardtongue; and (5) for the Marine Corps Logistics Base near Barstow, the management of the desert tortoise.

Appendix H3
California Natural Diversity Database and Rarefind

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Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: County is (Los Angeles)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S3	WL
Acmispon argophyllus var. adsurgens San Clemente Island bird's-foot trefoil	PDFAB2A041	None	Endangered	G5T1	S1	1B.1
Acmispon dendroideus var. traskiae San Clemente Island lotus	PDFAB2A1G2	Threatened	Endangered	G4T2	S2	1B.1
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	None	G2G3	S2	SSC
Aglaothorax longipennis Santa Monica shieldback katydid	IIORT32020	None	None	G1G2	S1S2	
Aimophila ruficeps canescens southern California rufous-crowned sparrow	ABPBX91091	None	None	G5T3	S2S3	WL
Ammodramus savannarum grasshopper sparrow	ABPBXA0020	None	None	G5	S2	SSC
Ammospermophilus nelsoni Nelson's antelope squirrel	AMAFB04040	None	Threatened	G2	S2	
Anaxyrus californicus arroyo toad	AAABB01230	Endangered	None	G2G3	S2S3	SSC
Anniella pulchra pulchra silvery legless lizard	ARACC01012	None	None	G3G4T3T4Q	S3	SSC
Anomobryum julaceum slender silver moss	NBMUS80010	None	None	G4G5	S2	2B.2
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Aphanisma blitoides aphanisma	PDCHE02010	None	None	G3G4	S3	1B.2
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Arctostaphylos catalinae Santa Catalina Island manzanita	PDERI04070	None	None	G2?	S2?	1B.2
Arctostaphylos glandulosa ssp. gabrielensis San Gabriel manzanita	PDERI042P0	None	None	G5T2	S2	1B.2
Arenaria paludicola marsh sandwort	PDCAR040L0	Endangered	Endangered	G1	S1	1B.1
Artemisiospiza belli belli Bell's sage sparrow	ABPBX97021	None	None	G5T2T4	S2?	WL
Artemisiospiza belli clementeae San Clemente sage sparrow	ABPBX97024	Threatened	None	G5T1Q	S1	SSC
Asio flammeus short-eared owl	ABNSB13040	None	None	G5	S3	SSC

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Aspidoscelis tigris stejnegeri coastal whiptail	ARACJ02143	None	None	G5T3T4	S2S3	
Astragalus brauntonii Braunton's milk-vetch	PDFAB0F1G0	Endangered	None	G2	S2	1B.1
Astragalus lentiginosus var. antonius San Antonio milk-vetch	PDFAB0FB92	None	None	G5T2	S2	1B.3
Astragalus leucolobus Big Bear Valley woollypod	PDFAB0F4T0	None	None	G2	S2	1B.2
Astragalus nevinii San Clemente Island milk-vetch	PDFAB0F5X0	None	None	G3	S3	1B.2
Astragalus preussii var. laxiflorus Lancaster milk-vetch	PDFAB0F721	None	None	G4T2	S1	1B.1
Astragalus pycnostachyus var. lanosissimus Ventura Marsh milk-vetch	PDFAB0F7B1	Endangered	Endangered	G2T1	S1	1B.1
Astragalus tener var. titi coastal dunes milk-vetch	PDFAB0F8R2	Endangered	Endangered	G2T1	S1	1B.1
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S2	SSC
Atriplex coulteri Coulter's saltbush	PDCHE040E0	None	None	G2	S2	1B.2
Atriplex pacifica south coast saltscale	PDCHE041C0	None	None	G3G4	S2	1B.2
Atriplex parishii Parish's brittlescale	PDCHE041D0	None	None	G1G2	S1	1B.1
Atriplex serenana var. davidsonii Davidson's saltscale	PDCHE041T1	None	None	G5T1	S1	1B.2
Baccharis malibuensis Malibu baccharis	PDAST0W0W0	None	None	G1	S1	1B.1
Batrachoseps gabrieli San Gabriel slender salamander	AAAAD02110	None	None	G2	S2	
Berberis nevinii Nevin's barberry	PDBER060A0	Endangered	Endangered	G1	S1	1B.1
Bergerocactus emoryi golden-spined cereus	PDCAC11010	None	None	G2	S2	2B.2
Boechera lincolnensis Lincoln rockcress	PDBRA061M3	None	None	G4?	S2	2B.3
Botrychium crenulatum scalloped moonwort	PPOPH010L0	None	None	G3	S2	2B.2
Brennania belkini Belkin's dune tabanid fly	IIDIP17010	None	None	G1G2	S1S2	
Brodiaea filifolia thread-leaved brodiaea	PMLIL0C050	Threatened	Endangered	G1	S1	1B.1

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Brodiaea kinkiensis San Clemente Island brodiaea	PMLIL0C080	None	None	G2	S2	1B.2
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S2	
California macrophylla round-leaved filaree	PDGER01070	None	None	G2	S2	1B.1
California Walnut Woodland California Walnut Woodland	CTT71210CA	None	None	G2	S2.1	
Callophrys mossii hidakupa San Gabriel Mountains elfin butterfly	IILEPE2206	None	None	G4T1T2	S1S2	
Calochortus clavatus var. gracilis slender mariposa-lily	PMLIL0D096	None	None	G4T2	S2	1B.2
Calochortus fimbriatus late-flowered mariposa-lily	PMLIL0D1J2	None	None	G3	S3	1B.2
Calochortus palmeri var. palmeri Palmer's mariposa-lily	PMLIL0D122	None	None	G3T3?	S3?	1B.2
Calochortus plummerae Plummer's mariposa-lily	PMLIL0D150	None	None	G4	S4	4.2
Calochortus striatus alkali mariposa-lily	PMLIL0D190	None	None	G2	S2	1B.2
Calochortus weedii var. intermedius intermediate mariposa-lily	PMLIL0D1J1	None	None	G3G4T2	S2	1B.2
Calystegia peirsonii Peirson's morning-glory	PDCON040A0	None	None	G3	S3.2	4.2
Calystegia sepium ssp. binghamiae Santa Barbara morning-glory	PDCON040E6	None	None	G5T1	S1	1B.1
Camissoniopsis guadalupensis ssp. clementina San Clemente Island evening-primrose	PDONA030M1	None	None	G3T3	S3	1B.2
Campylorhynchus brunneicapillus sandiegensis coastal cactus wren	ABPBG02095	None	None	G5T3Q	S3	SSC
Canbya candida white pygmy-poppy	PDPAP05020	None	None	G3	S3.2	4.2
Canyon Live Oak Ravine Forest Canyon Live Oak Ravine Forest	CTT61350CA	None	None	G3	S3.3	
Carex occidentalis western sedge	PMCYP039M0	None	None	G4	S2S3	2B.3
Carolella busckana Busck's gallmoth	IILEM2X090	None	None	G1G3	SH	
Castilleja gleasoni Mt. Gleason paintbrush	PDSCR0D140	None	Rare	G2Q	S2.2	1B.2

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Castilleja grisea San Clemente Island paintbrush	PDSCR0D160	Threatened	Endangered	G3	S3	1B.3
Catostomus santaanae Santa Ana sucker	AFCJC02190	Threatened	None	G1	S1	SSC
Centromadia parryi ssp. australis southern tarplant	PDAST4R0P4	None	None	G3T2	S2	1B.1
Ceratochrysis longimala Desert cuckoo wasp	IIHYM71040	None	None	G1	S1	
Cercocarpus traskiae Catalina Island mountain-mahogany	PDROS08030	Endangered	Endangered	G1	S1	1B.1
Chaenactis glabriuscula var. orcuttiana Orcutt's pincushion	PDAST20095	None	None	G5T1	S1	1B.1
Chaetodipus fallax fallax northwestern San Diego pocket mouse	AMAFD05031	None	None	G5T3	S2S3	SSC
Chaetodipus fallax pallidus pallid San Diego pocket mouse	AMAFD05032	None	None	G5T3	S3	SSC
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2	SSC
Charadrius montanus mountain plover	ABNNB03100	None	None	G3	S2?	SSC
Charina trivirgata rosy boa	ARADA01020	None	None	G4G5	S3S4	
Chelonia mydas green turtle	ARAAA02010	Threatened	None	G3	S1	
Chenopodium littoreum coastal goosefoot	PDCHE091Z0	None	None	G2	S2	1B.2
Chloropyron maritimum ssp. maritimum salt marsh bird's-beak	PDSCR0J0C2	Endangered	Endangered	G4?T1	S1	1B.2
Chorizanthe parryi var. fernandina San Fernando Valley spineflower	PDPGN040J1	Candidate	Endangered	G2T1	S1	1B.1
Chorizanthe parryi var. parryi Parry's spineflower	PDPGN040J2	None	None	G2T2	S2	1B.1
Cicindela gabbii western tidal-flat tiger beetle	IICOL02080	None	None	G2G4	S1	
Cicindela hirticollis gravida sandy beach tiger beetle	IICOL02101	None	None	G5T2	S1	
Cicindela latesignata latesignata western beach tiger beetle	IICOL02113	None	None	G2G4T1T2	S1	
Cicindela senilis frosti senile tiger beetle	IICOL02121	None	None	G2G3T1T3	S1	
Cladium californicum California saw-grass	PMCYP04010	None	None	G4	S2.2	2B.2

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Clarkia xantiana ssp. parviflora Kern Canyon clarkia	PDONA05181	None	None	G4T3	S3	4.2
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Proposed Threatened	Endangered	G5T3Q	S1	
Coelus globosus globose dune beetle	IICOL4A010	None	None	G1	S1	
Constancea nevinii Nevin's woolly sunflower	PDAST3N090	None	None	G2	S2.3	1B.3
Crossosoma californicum Catalina crossosoma	PDCRO02020	None	None	G2	S2	1B.2
Cryptantha clokeyi Clokey's cryptantha	PDBOR0A3M0	None	None	G2	S2	1B.2
Cryptantha traskiae Trask's cryptantha	PDBOR0A370	None	None	G2	S2	1B.1
Cryptantha wigginsii Wiggins' cryptantha	PDBOR0A400	None	None	G2	S1	1B.2
Cuscuta obtusiflora var. glandulosa Peruvian dodder	PDCUS01111	None	None	G5T4T5	SH	2B.2
Cymopterus deserticola desert cymopterus	PDAPI0U090	None	None	G2	S2	1B.2
Cypseloides niger black swift	ABNUA01010	None	None	G4	S2	SSC
Danaus plexippus monarch butterfly	IILEPP2010	None	None	G5	S3	
Deinandra minthornii Santa Susana tarplant	PDAST4R0J0	None	Rare	G2	S2.2	1B.2
Delphinium variegatum ssp. kinkiense San Clemente Island larkspur	PDRAN0B1X3	Endangered	Endangered	G4T2	S2	1B.1
Delphinium variegatum ssp. thornei Thorne's royal larkspur	PDRAN0B1X2	None	None	G4T2	S2	1B.1
Dendromecon harfordii var. rhamnoides south island bush-poppy	PDPAP08012	None	None	G4T1Q	S1	3.1
Diadophis punctatus modestus San Bernardino ringneck snake	ARADB10015	None	None	G5T2T3Q	S2?	
Didymodon norrisii Norris' beard moss	NBMUS2C0H0	None	None	G3G4	S3S4	2B.2
Diplectrona californica California diplectronan caddisfly	IITRI23010	None	None	G1G2	S1S2	
Dipodomys merriami parvus San Bernardino kangaroo rat	AMAFD03143	Endangered	None	G5T1	S1	SSC
Dissanthelium californicum California dissanthelium	PMPOA29010	None	None	G1	S1	1B.2

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Dithyrea maritima beach spectaclepod	PDBRA10020	None	Threatened	G2	S2.1	1B.1
Dodecahema leptoceras slender-horned spineflower	PDPGN0V010	Endangered	Endangered	G1	S1	1B.1
Drymocallis cuneifolia var. ewanii Ewan's cinquefoil	PDROS1B0S3	None	None	G1T1	S1	1B.3
Dudleya blochmaniae ssp. blochmaniae Blochman's dudleya	PDCRA04051	None	None	G2T2	S2.1	1B.1
Dudleya cymosa ssp. agourensis Agoura Hills dudleya	PDCRA040A7	Threatened	None	G5T1	S2	1B.2
Dudleya cymosa ssp. crebrifolia San Gabriel River dudleya	PDCRA040A8	None	None	G5T1	S1	1B.2
Dudleya cymosa ssp. marcescens marcescent dudleya	PDCRA040A3	Threatened	Rare	G5T2	S2	1B.2
Dudleya cymosa ssp. ovatifolia Santa Monica dudleya	PDCRA040A5	Threatened	None	G5T1	S1	1B.2
Dudleya densiflora San Gabriel Mountains dudleya	PDCRA040B0	None	None	G2	S2	1B.1
Dudleya multicaulis many-stemmed dudleya	PDCRA040H0	None	None	G2	S2	1B.2
Dudleya virens ssp. hassei Catalina Island dudleya	PDCRA040S1	None	None	G2?T2?	S2?	1B.2
Dudleya virens ssp. insularis island green dudleya	PDCRA040S2	None	None	G2?T2	S2.2	1B.2
Dudleya virens ssp. virens bright green dudleya	PDCRA040S3	None	None	G2?T1	S1	1B.2
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3	FP
Empidonax traillii extimus southwestern willow flycatcher	ABPAE33043	Endangered	Endangered	G5T1T2	S1	
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Ensatina eschscholtzii croceator yellow-blotched salamander	AAAAD04011	None	None	G5T2T3	S2S3	SSC
Ensatina klauberi large-blotched salamander	AAAAD04013	None	None	G2G3	S2S3	SSC
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T3Q	S3	WL
Eriogonum giganteum var. formosum San Clemente Island buckwheat	PDPGN082A2	None	None	G2T2	S2.2	1B.2
Eriogonum kennedyi var. alpigenum southern alpine buckwheat	PDPGN083B1	None	None	G4T2	S2.3	1B.3

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Eriogonum microthecum var. johnstonii Johnston's buckwheat	PDPGN083W5	None	None	G5T2	S2	1B.3
Eriophyllum mohavense Barstow woolly sunflower	PDAST3N070	None	None	G2	S2	1B.2
Eucosma hennei Henne's eucosman moth	IILEM0R390	None	None	G1	S1	
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S2S3	SSC
Euderma maculatum spotted bat	AMACC07010	None	None	G4	S2S3	SSC
Eumops perotis californicus western mastiff bat	AMACD02011	None	None	G5T4	S3?	SSC
Euphilotes battoides allyni El Segundo blue butterfly	IILEPG201B	Endangered	None	G5T1	S1	
Euphorbia misera cliff spurge	PDEUP0Q1B0	None	None	G5	S2	2B.2
Falco columbarius merlin	ABNKD06030	None	None	G5	S3	WL
Falco mexicanus prairie falcon	ABNKD06090	None	None	G5	S3	WL
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S2	FP
Fimbristylis thermalis hot springs fimbristylis	PMCYP0B0N0	None	None	G4	S2.2	2B.2
Galium catalinense ssp. acrispum San Clemente Island bedstraw	PDRUB0N0F1	None	Endangered	G4T2	S2	1B.2
Galium catalinense ssp. catalinense Santa Catalina Island bedstraw	PDRUB0N0F2	None	None	G4T2T3	S2S3	1B.2
Galium grande San Gabriel bedstraw	PDRUB0N0V0	None	None	G2	S2.2	1B.2
Gambelia speciosa showy island snapdragon	PDSCR2H010	None	None	G2	S2.2	1B.2
Gasterosteus aculeatus williamsoni unarmored threespine stickleback	AFCPA03011	Endangered	Endangered	G5T1	S1	FP
Gila orcuttii arroyo chub	AFCJB13120	None	None	G2	S2	SSC
Glaucopsyche lygdamus palosverdesensis Palos Verdes blue butterfly	IILEPG402A	Endangered	None	G5T1	S1	
Gopherus agassizii desert tortoise	ARAAF01010	Threatened	Threatened	G3	S2	
Graphis saxorum Baja rock lichen	NLTES29470	None	None	G1G3	S1S3	

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Gymnogyps californianus California condor	ABNKA03010	Endangered	Endangered	G1	S1	
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S2	FP
Haplotrema catalinense Santa Catalina lancetooth	IMGAS36030	None	None	G1	S1	
Harpagonella palmeri Palmer's grapplinghook	PDBOR0H010	None	None	G4	S3.2	4.2
Hazardia cana San Clemente Island hazardia	PDAST4H020	None	None	G2	S2	1B.2
Helianthemum greenei island rush-rose	PDCIS02090	Threatened	None	G2	S2	1B.2
Helianthus inexpectatus Newhall sunflower	PDAST4N250	None	None	G1	S1	1B.1
Helianthus nuttallii ssp. parishii Los Angeles sunflower	PDAST4N102	None	None	G5TH	SH	1A
Horkelia cuneata var. puberula mesa horkelia	PDROS0W045	None	None	G4T2	S2.1	1B.1
Icteria virens yellow-breasted chat	ABPBX24010	None	None	G5	S3	SSC
Imperata brevifolia California satintail	PMPOA3D020	None	None	G2	S2.1	2B.1
Island Cherry Forest Island Cherry Forest	CTT81810CA	None	None	G2	S2.1	
Island Ironwood Forest Island Ironwood Forest	CTT81700CA	None	None	G2	S2.1	
Isocoma menziesii var. decumbens decumbent goldenbush	PDAST57091	None	None	G3G5T2T3	S2.2	1B.2
Lampropeltis zonata (parvirubra) California mountain kingsnake (San Bernardino population)	ARADB19062	None	None	G4G5	S2?	SSC
Lampropeltis zonata (pulchra) California mountain kingsnake (San Diego population)	ARADB19063	None	None	G4G5	S1S2	SSC
Lanius ludovicianus loggerhead shrike	ABPBR01030	None	None	G4	S4	SSC
Lanius ludovicianus mearnsi San Clemente loggerhead shrike	ABPBR01036	Endangered	None	G4T1Q	S1	SSC
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G5	S3S4	
Lasiurus blossevillii western red bat	AMACC05060	None	None	G5	S3?	SSC
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4?	

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Lasiurus xanthinus western yellow bat	AMACC05070	None	None	G5	S3	SSC
Lasthenia glabrata ssp. coulteri Coulter's goldfields	PDAST5L0A1	None	None	G4T3	S2.1	1B.1
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G4T1	S1	FP
Lavatera assurgentiflora ssp. glabra southern island mallow	PDMAL0N022	None	None	G1T1	S1	1B.1
Layia heterotricha pale-yellow layia	PDAST5N070	None	None	G2	S2	1B.1
Lepechinia rossii Ross' pitcher sage	PDLAM0V060	None	None	G1	S1	1B.2
Lepidium virginicum var. robinsonii Robinson's pepper-grass	PDBRA1M114	None	None	G5T3	S3	4.3
Leptosiphon pygmaeus ssp. pygmaeus pygmy leptosiphon	PDPLM09102	None	None	G4T1	S1	1B.2
Lepus californicus bennettii San Diego black-tailed jackrabbit	AMAEB03051	None	None	G5T3?	S3?	SSC
Lewisia brachycalyx short-sepaled lewisia	PDPOR04010	None	None	G4G5	S2	2B.2
Lilium parryi lemon lily	PMLIL1A0J0	None	None	G3	S3	1B.2
Linanthus concinnus San Gabriel linanthus	PDPLM090D0	None	None	G3	S3	1B.2
Lithophragma maximum San Clemente Island woodland star	PDSAX0M070	Endangered	Endangered	G1	S1	1B.1
Loeflingia squarrosa var. artemisiarum sagebrush loeflingia	PDCAR0E011	None	None	G5T2T3	S2.2	2B.2
Lomatium insulare San Nicolas Island lomatium	PDAPI1B0W0	None	None	G2G3	S2S3	1B.2
Lonicera subspicata var. subspicata Santa Barbara honeysuckle	PDCPR030R3	None	None	G5T2	S2	1B.2
Lupinus guadalupensis Guadalupe Island lupine	PDFAB2B1T0	None	None	G3	S3	1B.2
Lupinus peirsonii Peirson's lupine	PDFAB2B330	None	None	G2	S2	1B.3
Lycium brevipes var. hassei Santa Catalina Island desert-thorn	PDSOL0G0N0	None	None	G1Q	S1	1B.1
Lyonothamnus floribundus ssp. aspleniifolius Santa Cruz Island ironwood	PDROS12011	None	None	G3T3	S3	1B.2
Lyonothamnus floribundus ssp. floribundus Santa Catalina Island ironwood	PDROS12012	None	None	G3T2	S2	1B.2

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Macrotus californicus California leaf-nosed bat	AMACB01010	None	None	G4	S2S3	SSC
Mainland Cherry Forest Mainland Cherry Forest	CTT81820CA	None	None	G1	S1.1	
Malacothamnus clementinus San Clemente Island bush-mallow	PDMAL0Q030	Endangered	Endangered	G2	S2	1B.1
Malacothamnus davidsonii Davidson's bush-mallow	PDMAL0Q040	None	None	G2	S2	1B.2
Maritime Succulent Scrub Maritime Succulent Scrub	CTT32400CA	None	None	G2	S1.1	
Melospiza melodia graminea Channel Island song sparrow	ABPBXA301C	None	None	G5T1	S1	SSC
Micrarionta gabbi San Clemente islandsnail	IMGASC5030	None	None	G1	S1	
Microtus californicus stephensi south coast marsh vole	AMAFF11035	None	None	G5T1T2	S1S2	SSC
Mimulus traskiae Santa Catalina Island monkeyflower	PDSCR1B2P0	None	None	GX	SX	1A
Mojave Riparian Forest Mojave Riparian Forest	CTT61700CA	None	None	G1	S1.1	
Monardella hypoleuca ssp. hypoleuca white-veined monardella	PDLAM180A3	None	None	G4T2T3	S2S3	1B.3
Monardella macrantha ssp. hallii Hall's monardella	PDLAM180E1	None	None	G5T3	S3	1B.3
Muhlenbergia appressa appressed muhly	PMPOA48020	None	None	G4	S3	2B.2
Muhlenbergia californica California muhly	PMPOA480A0	None	None	G3	S3.3	4.3
Munzothamnus blairii Blair's munzothamnus	PDAST8U0K0	None	None	G2	S2.2	1B.2
Myotis ciliolabrum western small-footed myotis	AMACC01140	None	None	G5	S2S3	
Myotis evotis long-eared myotis	AMACC01070	None	None	G5	S4?	
Myotis thysanodes fringed myotis	AMACC01090	None	None	G4	S4	
Myotis volans long-legged myotis	AMACC01110	None	None	G5	S4?	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4?	
Nama stenocarpum mud nama	PDHYD0A0H0	None	None	G4G5	S1S2	2B.2

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Nasturtium gambelii Gambel's water cress	PDBRA270V0	Endangered	Threatened	G1	S1	1B.1
Navarretia fossalis spreading navarretia	PDPLM0C080	Threatened	None	G1	S1	1B.1
Navarretia peninsularis Baja navarretia	PDPLM0C0L0	None	None	G3?	S2	1B.2
Navarretia prostrata prostrate vernal pool navarretia	PDPLM0C0Q0	None	None	G2	S2	1B.1
Navarretia setiloba Piute Mountains navarretia	PDPLM0C0S0	None	None	G2	S2	1B.1
Nemacaulis denudata var. denudata coast woolly-heads	PDPGN0G011	None	None	G3G4T3?	S2.2	1B.2
Nemacladus secundiflorus var. robbinsii Robbins' nemacladus	PDCAM0F0B2	None	None	G3T2T3	S2S3	1B.2
Neotamias speciosus speciosus lodgepole chipmunk	AMAFB02172	None	None	G4T2T3	S2S3	
Neotoma lepida intermedia San Diego desert woodrat	AMAFF08041	None	None	G5T3?	S3?	SSC
Nyctinomops femorosaccus pocketed free-tailed bat	AMACD04010	None	None	G4	S2S3	SSC
Nyctinomops macrotis big free-tailed bat	AMACD04020	None	None	G5	S2	SSC
Oceanodroma homochroa ashy storm-petrel	ABNDC04030	None	None	G2	S2	SSC
Oncorhynchus mykiss irideus southern steelhead - southern California DPS	AFCHA0209J	Endangered	None	G5T2Q	S2	SSC
Onychobaris langei Lange's El Segundo Dune weevil	IICOL4W010	None	None	G1	S1	
Onychomys torridus ramona southern grasshopper mouse	AMAFF06022	None	None	G5T3?	S3?	SSC
Open Engelmann Oak Woodland Open Engelmann Oak Woodland	CTT71181CA	None	None	G2	S2.2	
Opuntia basilaris var. brachyclada short-joint beavertail	PDCAC0D053	None	None	G5T3	S3	1B.2
Orcuttia californica California Orcutt grass	PMPOA4G010	Endangered	Endangered	G1	S1	1B.1
Oreonana vestita woolly mountain-parsley	PDAPI1G030	None	None	G3	S3	1B.3
Orobanche parishii ssp. brachyloba short-lobed broomrape	PDORO040A2	None	None	G4?T3	S3.2	4.2
Orobanche valida ssp. valida Rock Creek broomrape	PDORO040G2	None	None	G3T2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Ovis canadensis nelsoni desert bighorn sheep	AMALE04013	None	None	G4T4	S3	FP
Oxytropis oreophila var. oreophila rock-loving oxytrope	PDFAB2X0H3	None	None	G5T4	S2	2B.3
Panoquina errans wandering (=saltmarsh) skipper	IILEP84030	None	None	G4G5	S1	
Parnassia cirrata var. cirrata San Bernardino grass-of-Parnassus	PDSAX0P030	None	None	G5T2	S2.3	1B.3
Passerculus sandwichensis beldingi Belding's savannah sparrow	ABPBX99015	None	Endangered	G5T3	S3	
Pentachaeta lyonii Lyon's pentachaeta	PDAST6X060	Endangered	Endangered	G2	S2	1B.1
Perognathus alticolus inexpectatus Tehachapi pocket mouse	AMAFD01082	None	None	G1G2T1T2	S1S2	SSC
Perognathus inornatus inornatus San Joaquin pocket mouse	AMAFD01061	None	None	G4T2T3	S2S3	
Perognathus longimembris brevinasus Los Angeles pocket mouse	AMAFD01041	None	None	G5T1T2	S1S2	SSC
Perognathus longimembris pacificus Pacific pocket mouse	AMAFD01042	Endangered	None	G5T1	S1	SSC
Phacelia floribunda many-flowered phacelia	PDHYD0C1G0	None	None	G2	S2	1B.2
Phacelia stellaris Brand's star phacelia	PDHYD0C510	None	None	G1	S1	1B.1
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G3G4	S3S4	SSC
Plagiobothrys parishii Parish's popcornflower	PDBOR0V0U0	None	None	G1	S1	1B.1
Plebejus saepiolus aureolus San Gabriel Mountains blue butterfly	IILEPG6011	None	None	G5T1	S1	
Plebulina emigdionis San Emigdio blue butterfly	IILEPG7010	None	None	G2G3	S2S3	
Plegadis chihi white-faced ibis	ABNGE02020	None	None	G5	S1	WL
Polioptila californica californica coastal California gnatcatcher	ABPBJ08081	Threatened	None	G3T2	S2	SSC
Potentilla multijuga Ballona cinquefoil	PDROS1B120	None	None	GX	SX	1A
Pristiloma shepardae Shepard's snail	IMGAS80110	None	None	G1	S1	
Pseudognaphalium leucocephalum white rabbit-tobacco	PDAST440C0	None	None	G4	S2S3.2	2B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Radiocentrum avalonense Catalina mountainsnail	IMGASB6010	None	None	G1	S1	
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Rana muscosa southern mountain yellow-legged frog	AAABH01330	Endangered	Endangered	G1	S1	SSC
Rhaphiomidas terminatus terminatus El Segundo flower-loving fly	IIDIP05022	None	None	G1T1	S1	
Rhinichthys osculus ssp. 3 Santa Ana speckled dace	AFCJB3705K	None	None	G5T1	S1	SSC
Ribes divaricatum var. parishii Parish's gooseberry	PDGRO020F3	None	None	G4TH	SH	1A
Ribes viburnifolium Santa Catalina Island currant	PDGRO021P0	None	None	G2?	S2?	1B.2
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2S3	
Riversidian Alluvial Fan Sage Scrub Riversidian Alluvial Fan Sage Scrub	CTT32720CA	None	None	G1	S1.1	
Scrophularia villosa Santa Catalina figwort	PDSCR1S0D0	None	None	G3	S3	1B.2
Scutellaria bolanderi ssp. austromontana southern mountains skullcap	PDLAM1U0A1	None	None	G4T2	S2	1B.2
Senecio aphanactis chaparral ragwort	PDAST8H060	None	None	G3?	S2	2B.2
Sibara filifolia Santa Cruz Island winged-rockcress	PDBRA2A020	Endangered	None	G1	S1	1B.1
Sidalcea neomexicana Salt Spring checkerbloom	PDMAL110J0	None	None	G4?	S2S3	2B.2
Siphateles bicolor mohavensis Mohave tui chub	AFCJB1303H	Endangered	Endangered	G4T1	S1	FP
Socalchemmis gertschi Gertsch's socalchemmis spider	ILARAU7010	None	None	G1	S1	
Solanum wallacei Wallace's nightshade	PDSOL0Z280	None	None	G2Q	S2.1	1B.1
Sorex ornatus salicornicus southern California saltmarsh shrew	AMABA01104	None	None	G5T1?	S1	SSC
Sorex ornatus willetti Santa Catalina shrew	AMABA01101	None	None	G5T1	S1	SSC
Southern California Arroyo Chub/Santa Ana Sucker Stream Southern California Arroyo Chub/Santa Ana Sucker Stream	CARE2330CA	None	None	GNR	SNR	
Southern California Coastal Lagoon Southern California Coastal Lagoon	CALE1220CA	None	None	GNR	SNR	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Southern California Steelhead Stream	CARE2310CA	None	None	GNR	SNR	
Southern California Steelhead Stream						
Southern California Threespine Stickleback Stream	CARE2320CA	None	None	GNR	SNR	
Southern California Threespine Stickleback Stream						
Southern Coast Live Oak Riparian Forest	CTT61310CA	None	None	G4	S4	
Southern Coast Live Oak Riparian Forest						
Southern Coastal Bluff Scrub	CTT31200CA	None	None	G1	S1.1	
Southern Coastal Bluff Scrub						
Southern Coastal Salt Marsh	CTT52120CA	None	None	G2	S2.1	
Southern Coastal Salt Marsh						
Southern Cottonwood Willow Riparian Forest	CTT61330CA	None	None	G3	S3.2	
Southern Cottonwood Willow Riparian Forest						
Southern Dune Scrub	CTT21330CA	None	None	G1	S1.1	
Southern Dune Scrub						
Southern Foredunes	CTT21230CA	None	None	G2	S2.1	
Southern Foredunes						
Southern Mixed Riparian Forest	CTT61340CA	None	None	G2	S2.1	
Southern Mixed Riparian Forest						
Southern Riparian Forest	CTT61300CA	None	None	G4	S4	
Southern Riparian Forest						
Southern Riparian Scrub	CTT63300CA	None	None	G3	S3.2	
Southern Riparian Scrub						
Southern Sycamore Alder Riparian Woodland	CTT62400CA	None	None	G4	S4	
Southern Sycamore Alder Riparian Woodland						
Southern Willow Scrub	CTT63320CA	None	None	G3	S2.1	
Southern Willow Scrub						
Spea hammondii	AAABF02020	None	None	G3	S3	SSC
western spadefoot						
Sterkia clementina	IMGAS19020	None	None	G1	S1	
San Clemente Island blunt-top snail						
Sternula antillarum browni	ABNNM08103	Endangered	Endangered	G4T2T3Q	S2S3	FP
California least tern						
Stylocline masonii	PDAST8Y080	None	None	G1	S1	1B.1
Mason's neststraw						
Suaeda esteroa	PDCHE0P0D0	None	None	G3	S2	1B.2
estuary seablite						
Symphyotrichum defoliatum	PDASTE80C0	None	None	G2	S2	1B.2
San Bernardino aster						
Symphyotrichum greatae	PDASTE80U0	None	None	G2	S2.3	1B.3
Greata's aster						
Synthliboramphus hypoleucus	ABNNN07010	Candidate	Threatened	G3G4	S3	
Xantus' murrelet						

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Taricha torosa Coast Range newt	AAAAF02032	None	None	G4	S4	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S4	SSC
Texosporium sancti-jacobi woven-spored lichen	NLTEST7980	None	None	G3	S1	
Thamnophis hammondii two-striped garter snake	ARADB36160	None	None	G4	S2	SSC
Thamnophis hammondii ssp. Santa Catalina garter snake	ARADB36161	None	None	G4T1?	S1	SSC
Thelypteris puberula var. sonorensis Sonoran maiden fern	PPTHE05192	None	None	G5T3	S2.2?	2B.2
Thysanocarpus rigidus rigid fringepod	PDBRA2Q070	None	None	G1G2	S1S2	1B.2
Tortula californica California screw moss	NBMUS7L090	None	None	G2?	S2	1B.2
Toxostoma lecontei Le Conte's thrasher	ABPBK06100	None	None	G4	S3	SSC
Trigonoscuta dorothea dorothea Dorothy's El Segundo Dune weevil	IICOL51021	None	None	G1T1	S1	
Trimerotropis occidentiloides Santa Monica grasshopper	IIORT36300	None	None	G1G2	S1S2	
Triteleia clementina San Clemente Island triteleia	PMLIL21020	None	None	G2	S2	1B.2
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2G3	S2S3	
Urocyon littoralis catalinae Santa Catalina Island fox	AMAJA04022	Endangered	Threatened	G1T1	S1	
Urocyon littoralis clementae San Clemente Island fox	AMAJA04023	None	Threatened	G1T1	S1	
Valley Needlegrass Grassland Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
Valley Oak Woodland Valley Oak Woodland	CTT71130CA	None	None	G3	S2.1	
Viola pinetorum var. grisea grey-leaved violet	PDVIO04431	None	None	G4G5T3?	S3?	1B.3
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	
Walnut Forest Walnut Forest	CTT81600CA	None	None	G1	S1.1	
Wildflower Field Wildflower Field	CTT42300CA	None	None	G2	S2.2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Xantusia riversiana island night lizard	ARACK01020	Threatened	None	G1	S1	
Xerarionta intercisa horseshoe snail	IMGASD1010	None	None	G1	S1	
Xerarionta redimita wreathed cactussnail	IMGASD1030	None	None	G1G2	S1	
Xerospermophilus mohavensis Mohave ground squirrel	AMAFB05150	None	Threatened	G2G3	S2S3	

Record Count: 318

Appendix H4
Inventory of Rare and Endangered Plants of California

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CNPS California Native Plant Society Rare and Endangered Plant Inventory

Plant List

211 matches found. *Click on scientific name for details*

Search Criteria

Found in Los Angeles County

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Abronia maritima	red sand-verbena	Nyctaginaceae	perennial herb	4.2	S3?	G4?
Abronia villosa var. aurita	chaparral sand-verbena	Nyctaginaceae	annual herb	1B.1	S2	G5T3T4
Acanthomintha obovata ssp. cordata	heart-leaved thorn-mint	Lamiaceae	annual herb	4.2	S3.2?	G3?T3?
Acanthoscyphus parishii var. parishii	Parish's oxytheca	Polygonaceae	annual herb	4.2	S3.2	G4?T3
Allium howellii var. clokeyi	Mt. Pinos onion	Alliaceae	perennial bulbiferous herb	1B.3	S2	G4T2
Amaranthus watsonii	Watson's amaranth	Amaranthaceae	annual herb	4.3	S3.3	G4G5
Androsace elongata ssp. acuta	California androsace	Primulaceae	annual herb	4.2	S3.2?	G5?T3T4
Anomobryum julaceum	slender silver moss	Bryaceae	moss	2B.2	S2	G4G5
Aphanisma blitoides	aphanisma	Chenopodiaceae	annual herb	1B.2	S3	G3G4
Arctostaphylos crustacea ssp. subcordata	Santa Cruz Island manzanita	Ericaceae	perennial evergreen shrub	4.2	S3.2	G4T3
Arctostaphylos glandulosa ssp. gabrielensis	San Gabriel manzanita	Ericaceae	perennial evergreen shrub	1B.2	S2	G5T2
Arctostaphylos parryana ssp. tumescens	interior manzanita	Ericaceae	perennial evergreen shrub	4.3	S3	G4T3
Arenaria paludicola	marsh sandwort	Caryophyllaceae	perennial stoloniferous herb	1B.1	S1	G1
Asplenium vespertinum	western spleenwort	Aspleniaceae	perennial rhizomatous herb	4.2	S3.2	G3?
Astragalus bicristatus	crested milk-vetch	Fabaceae	perennial herb	4.3	S3.3	G3
Astragalus brauntonii	Braunton's milk-vetch	Fabaceae	perennial herb	1B.1	S2	G2
Astragalus lentiginosus var. antonius	San Antonio milk-vetch	Fabaceae	perennial herb	1B.3	S2	G5T2
Astragalus lentiginosus var. sierrae	Big Bear Valley milk-vetch	Fabaceae	perennial herb	1B.2	S2	G5T2
	Big Bear Valley					

Astragalus leucolobus	woollypod	Fabaceae	perennial herb	1B.2	S2	G2
Astragalus preussii var. laxiflorus	Lancaster milk-vetch	Fabaceae	perennial herb	1B.1	S1	G4T2
Astragalus pycnostachyus var. lanosissimus	Ventura marsh milk-vetch	Fabaceae	perennial herb	1B.1	S1	G2T1
Astragalus tener var. titi	coastal dunes milk-vetch	Fabaceae	annual herb	1B.1	S1	G2T1
Atriplex coulteri	Coulter's saltbush	Chenopodiaceae	perennial herb	1B.2	S2	G2
Atriplex pacifica	South Coast saltscale	Chenopodiaceae	annual herb	1B.2	S2	G3G4
Atriplex parishii	Parish's brittlescale	Chenopodiaceae	annual herb	1B.1	S1	G1G2
Atriplex serenana var. davidsonii	Davidson's saltscale	Chenopodiaceae	annual herb	1B.2	S1	G5T1
Baccharis malibuensis	Malibu baccharis	Asteraceae	perennial deciduous shrub	1B.1	S1	G1
Baccharis plummerae ssp. plummerae	Plummer's baccharis	Asteraceae	perennial deciduous shrub	4.3	S3.2	G3T3
Berberis nevinii	Nevin's barberry	Berberidaceae	perennial evergreen shrub	1B.1	S1	G1
Bergerocactus emoryi	golden-spined cereus	Cactaceae	perennial stem succulent	2B.2	S2	G2
Boechera dispar	pinyon rockcress	Brassicaceae	perennial herb	2B.3	S3	G3
Boechera lincolnensis	Lincoln rockcress	Brassicaceae	perennial herb	2B.3	S2	G4?
Botrychium crenulatum	scalloped moonwort	Ophioglossaceae	perennial rhizomatous herb	2B.2	S2	G3
Brodiaea filifolia	thread-leaved brodiaea	Themidaceae	perennial bulbiferous herb	1B.1	S1	G1
Calandrinia breweri	Brewer's calandrinia	Montiaceae	annual herb	4.2	S3.2?	G4
California macrophylla	round-leaved filaree	Geraniaceae	annual herb	1B.1	S2	G2
Calochortus catalinae	Catalina mariposa lily	Liliaceae	perennial bulbiferous herb	4.2	S3.2	G3
Calochortus clavatus var. clavatus	club-haired mariposa lily	Liliaceae	perennial bulbiferous herb	4.3	S3	G4T3
Calochortus clavatus var. gracilis	slender mariposa lily	Liliaceae	perennial bulbiferous herb	1B.2	S2	G4T2
Calochortus fimbriatus	late-flowered mariposa lily	Liliaceae	perennial bulbiferous herb	1B.3	S3	G3
Calochortus palmeri var. palmeri	Palmer's mariposa lily	Liliaceae	perennial bulbiferous herb	1B.2	S3?	G3T3?
Calochortus plummerae	Plummer's mariposa lily	Liliaceae	perennial bulbiferous herb	4.2	S4	G4
Calochortus striatus	alkali mariposa lily	Liliaceae	perennial bulbiferous herb	1B.2	S2	G2
Calochortus weedii var. intermedius	intermediate mariposa lily	Liliaceae	perennial bulbiferous herb	1B.2	S2	G3G4T2
Calystegia peirsonii	Peirson's morning-glory	Convolvulaceae	perennial rhizomatous herb	4.2	S3.2	G3

Calystegia sepium ssp. binghamiae	Santa Barbara morning-glory	Convolvulaceae	perennial rhizomatous herb	1B.1	S1	G5T1
Camissoniopsis lewisii	Lewis' evening-primrose	Onagraceae	annual herb	3	S1S3	G2G3
Canbya candida	white pygmy-poppy	Papaveraceae	annual herb	4.2	S3.2	G3
Carex occidentalis	western sedge	Cyperaceae	perennial rhizomatous herb	2B.3	S2S3	G4
Castilleja gleasoni	Mt. Gleason paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	1B.2	S2.2	G2Q
Castilleja plagiotoma	Mojave paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	4.3	S3.3	G3
Centromadia parryi ssp. australis	southern tarplant	Asteraceae	annual herb	1B.1	S2	G3T2
Cercocarpus betuloides var. blancheae	island mountain-mahogany	Rosaceae	perennial evergreen shrub	4.3	S3.3	G5T3
Chaenactis glabriuscula var. orcuttiana	Orcutt's pincushion	Asteraceae	annual herb	1B.1	S1	G5T1
Chamaebatia australis	southern mountain misery	Rosaceae	perennial evergreen shrub	4.2	S3.2	G4
Chenopodium littoreum	coastal goosefoot	Chenopodiaceae	annual herb	1B.2	S2	G2
Chloropyron maritimum ssp. maritimum	salt marsh bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	1B.2	S1	G4?T1
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower	Polygonaceae	annual herb	1B.1	S1	G2T1
Chorizanthe parryi var. parryi	Parry's spineflower	Polygonaceae	annual herb	1B.1	S2	G2T2
Chorizanthe spinosa	Mojave spineflower	Polygonaceae	annual herb	4.2	S3.2	G3
Chorizanthe xanti var. leucotheca	white-bracted spineflower	Polygonaceae	annual herb	1B.2	S2	G4T2
Cicuta maculata var. bolanderi	Bolander's water-hemlock	Apiaceae	perennial herb	2B.1	S2	G5T3T4
Cistanthe maritima	seaside cistanthe	Montiaceae	annual herb	4.2	S3.2	G3G4
Cladium californicum	California sawgrass	Cyperaceae	perennial rhizomatous herb	2B.2	S2.2	G4
Clarkia xantiana ssp. parviflora	Kern Canyon clarkia	Onagraceae	annual herb	4.2	S3	G4T3
Clinopodium mimuloides	monkey-flower savory	Lamiaceae	perennial herb	4.2	S3.2	G3
Convolvulus simulans	small-flowered morning-glory	Convolvulaceae	annual herb	4.2	S3.2	G3
Crossosoma californicum	Catalina crossosoma	Crossosomataceae	perennial deciduous shrub	1B.2	S2	G2
Cryptantha clokeyi	Clokey's cryptantha	Boraginaceae	annual herb	1B.2	S2	G2
Cryptantha wigginsii	Wiggins' cryptantha	Boraginaceae	annual herb	1B.2	S1	G2
Cuscuta obtusiflora var. glandulosa	Peruvian dodder	Convolvulaceae	annual vine (parasitic)	2B.2	SH	G5T4T5
Cymopterus deserticola	desert cymopterus	Apiaceae	perennial herb	1B.2	S2	G2
Deinandra minthornii	Santa Susana tarplant	Asteraceae	perennial	1B.2	S2.2	G2

			deciduous shrub			
Dichondra occidentalis	western dichondra	Convolvulaceae	perennial rhizomatous herb	4.2	S3.2	G4?
Didymodon norrisii	Norris' beard moss	Pottiaceae	moss	2B.2	S3S4	G3G4
Dithyrea maritima	beach spectaclepod	Brassicaceae	perennial rhizomatous herb	1B.1	S2.1	G2
Dodecahema leptoceras	slender-horned spineflower	Polygonaceae	annual herb	1B.1	S1	G1
Drymocallis cuneifolia var. ewanii	Ewan's woodbeauty	Rosaceae	perennial herb	1B.3	S1	G1T1
Dudleya blochmaniae ssp. blochmaniae	Blochman's dudleya	Crassulaceae	perennial herb	1B.1	S2.1	G2T2
Dudleya cymosa ssp. agourensis	Agoura Hills dudleya	Crassulaceae	perennial herb	1B.2	S2	G5T1
Dudleya cymosa ssp. crebrifolia	San Gabriel River dudleya	Crassulaceae	perennial herb	1B.2	S1	G5T1
Dudleya cymosa ssp. marcescens	marcescent dudleya	Crassulaceae	perennial herb	1B.2	S2	G5T2
Dudleya cymosa ssp. ovatifolia	Santa Monica dudleya	Crassulaceae	perennial herb	1B.2	S1	G5T1
Dudleya densiflora	San Gabriel Mountains dudleya	Crassulaceae	perennial herb	1B.1	S2	G2
Dudleya multicaulis	many-stemmed dudleya	Crassulaceae	perennial herb	1B.2	S2	G2
Dudleya virens ssp. hassei	Catalina Island dudleya	Crassulaceae	perennial herb	1B.2	S2?	G2?T2?
Dudleya virens ssp. insularis	island green dudleya	Crassulaceae	perennial herb	1B.2	S2.2	G2?T2
Dudleya virens ssp. virens	bright green dudleya	Crassulaceae	perennial herb	1B.2	S1	G2?T1
Eriastrum hooveri	Hoover's eriastrum	Polemoniaceae	annual herb	4.2	S3.2	G3
Eriastrum rosamondense	Rosamond eriastrum	Polemoniaceae	annual herb	1B.1	S1	G1
Erigeron breweri var. jacinteus	San Jacinto Mountains daisy	Asteraceae	perennial rhizomatous herb	4.3	S3.3	G5T3
Eriogonum kennedyi var. alpigenum	southern alpine buckwheat	Polygonaceae	perennial herb	1B.3	S2.3	G4T2
Eriogonum microthecum var. johnstonii	Johnston's buckwheat	Polygonaceae	perennial deciduous shrub	1B.3	S2	G5T2
Eriogonum umbellatum var. minus	alpine sulfur-flowered buckwheat	Polygonaceae	perennial herb	4.3	S3.3	G5T3
Eriophyllum mohavense	Barstow woolly sunflower	Asteraceae	annual herb	1B.2	S2	G2
Erysimum suffrutescens	suffrutescent wallflower	Brassicaceae	perennial herb	4.2	S3.2	G3
Euphorbia misera	cliff spurge	Euphorbiaceae	perennial shrub	2B.2	S2	G5
Fimbristylis thermalis	hot springs fimbristylis	Cyperaceae	perennial rhizomatous herb	2B.2	S2.2	G4
Frasera neglecta	pine green-gentian	Gentianaceae	perennial herb	4.3	S3.3	G3

Fritillaria pinetorum	pine fritillary	Liliaceae	perennial bulbiferous herb	4.3	S3.3	G4
Galium andrewsii ssp. gatense	phlox-leaf serpentine bedstraw	Rubiaceae	perennial herb	4.2	S3.2	G5T3
Galium angustifolium ssp. gabrielense	San Antonio Canyon bedstraw	Rubiaceae	perennial herb	4.3	S3.3	G5T3
Galium cliftonsmithii	Santa Barbara bedstraw	Rubiaceae	perennial herb	4.3	S3.3	G3
Galium grande	San Gabriel bedstraw	Rubiaceae	perennial deciduous shrub	1B.2	S2.2	G2
Galium jepsonii	Jepson's bedstraw	Rubiaceae	perennial rhizomatous herb	4.3	S3.3	G3
Galium johnstonii	Johnston's bedstraw	Rubiaceae	perennial herb	4.3	S3.3	G3
Gilia latiflora ssp. cuyamensis	Cuyama gilia	Polemoniaceae	annual herb	4.3	S3.3	G5?T3
Goodmania luteola	golden goodmania	Polygonaceae	annual herb	4.2	S3.2	G3
Harpagonella palmeri	Palmer's grapplinghook	Boraginaceae	annual herb	4.2	S3.2	G4
Helianthus inexpectatus	Newhall sunflower	Asteraceae	perennial rhizomatous herb	1B.1	S1	G1
Helianthus nuttallii ssp. parishii	Los Angeles sunflower	Asteraceae	perennial rhizomatous herb	1A	SH	G5TH
Heuchera abramsii	Abrams' alumroot	Saxifragaceae	perennial rhizomatous herb	4.3	S3.3	G3
Heuchera caespitosa	urn-flowered alumroot	Saxifragaceae	perennial rhizomatous herb	4.3	S3.3	G3
Hordeum intercedens	vernal barley	Poaceae	annual herb	3.2	S3S4	G3G4
Horkelia cuneata var. puberula	mesa horkelia	Rosaceae	perennial herb	1B.1	S2.1	G4T2
Hulsea vestita ssp. gabrielensis	San Gabriel Mountains sunflower	Asteraceae	perennial herb	4.3	S3.3	G5T3
Hulsea vestita ssp. parryi	Parry's sunflower	Asteraceae	perennial herb	4.3	S3.3	G5T3
Imperata brevifolia	California satintail	Poaceae	perennial rhizomatous herb	2B.1	S2.1	G2
Isocoma menziesii var. decumbens	decumbent goldenbush	Asteraceae	perennial shrub	1B.2	S2.2	G3G5T2T3
Juglans californica	Southern California black walnut	Juglandaceae	perennial deciduous tree	4.2	S3.2	G3
Juncus acutus ssp. leopoldii	southwestern spiny rush	Juncaceae	perennial rhizomatous herb	4.2	S3.2	G5T5
Juncus duranii	Duran's rush	Juncaceae	perennial rhizomatous herb	4.3	S3.3	G3
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	Asteraceae	annual herb	1B.1	S2.1	G4T3
Layia heterotricha	pale-yellow layia	Asteraceae	annual herb	1B.1	S2	G2
Lepechinia fragrans	fragrant pitcher sage	Lamiaceae	perennial shrub	4.2	S3.2	G3
Lepechinia rossii	Ross' pitcher sage	Lamiaceae	perennial shrub	1B.2	S1	G1

Lepidium virginicum var. robinsonii	Robinson's pepper-grass	Brassicaceae	annual herb	4.3	S3	G5T3
Lilium humboldtii ssp. ocellatum	ocellated Humboldt lily	Liliaceae	perennial bulbiferous herb	4.2	S3.2	G4T3
Lilium parryi	lemon lily	Liliaceae	perennial bulbiferous herb	1B.2	S3	G3
Linanthus concinnus	San Gabriel linanthus	Polemoniaceae	annual herb	1B.2	S3	G3
Linanthus orcuttii	Orcutt's linanthus	Polemoniaceae	annual herb	1B.3	S2	G4
Loeflingia squarrosa var. artemisiarum	sagebrush loeflingia	Caryophyllaceae	annual herb	2B.2	S2.2	G5T2T3
Lonicera subspicata var. subspicata	Santa Barbara honeysuckle	Caprifoliaceae	perennial evergreen shrub	1B.2	S2	G5T2
Lupinus elatus	silky lupine	Fabaceae	perennial herb	4.3	S3.3	G3
Lupinus excubitus var. johnstonii	interior bush lupine	Fabaceae	perennial shrub	4.3	S3.3	G4T3
Lupinus peirsonii	Peirson's lupine	Fabaceae	perennial herb	1B.3	S2	G2
Lycium brevipes var. hassei	Santa Catalina Island desert-thorn	Solanaceae	perennial deciduous shrub	1B.1	S1	G1Q
Lycium californicum	California box-thorn	Solanaceae	perennial shrub	4.2	S3.2	G4
Malacothamnus davidsonii	Davidson's bush-mallow	Malvaceae	perennial deciduous shrub	1B.2	S2	G2
Microseris douglasii ssp. platycarpha	small-flowered microseris	Asteraceae	annual herb	4.2	S3.2	G4T3
Microseris sylvatica	sylvan microseris	Asteraceae	perennial herb	4.2	S3.2	G3
Mimulus johnstonii	Johnston's monkeyflower	Phrymaceae	annual herb	4.3	S3.3	G3
Monardella australis ssp. cinerea	gray monardella	Lamiaceae	perennial rhizomatous herb	4.3	S3.3	G4T3
Monardella hypoleuca ssp. hypoleuca	white-veined monardella	Lamiaceae	perennial herb	1B.3	S2S3	G4T2T3
Monardella macrantha ssp. hallii	Hall's monardella	Lamiaceae	perennial rhizomatous herb	1B.3	S3	G5T3
Monardella saxicola	rock monardella	Lamiaceae	perennial rhizomatous herb	4.2	S3.2	G3
Mucronea californica	California spineflower	Polygonaceae	annual herb	4.2	S3	G3
Muhlenbergia appressa	appressed muhly	Poaceae	annual herb	2B.2	S3	G4
Muhlenbergia californica	California muhly	Poaceae	perennial rhizomatous herb	4.3	S3.3	G3
Muilla coronata	crowned muilla	Themidaceae	perennial bulbiferous herb	4.2	S3.2?	G3
Nama stenocarpum	mud nama	Boraginaceae	annual / perennial herb	2B.2	S1S2	G4G5
Nasturtium gambelii	Gambel's water cress	Brassicaceae	perennial rhizomatous herb	1B.1	S1	G1
Navarretia fossalis	spreading navarretia	Polemoniaceae	annual herb	1B.1	S1	G1

Navarretia ojaiensis	Ojai navarretia	Polemoniaceae	annual herb	1B.1	S1	G1
Navarretia peninsularis	Baja navarretia	Polemoniaceae	annual herb	1B.2	S2	G3?
Navarretia prostrata	prostrate vernal pool navarretia	Polemoniaceae	annual herb	1B.1	S2	G2
Navarretia setiloba	Piute Mountains navarretia	Polemoniaceae	annual herb	1B.1	S2	G2
Nemacaulis denudata var. denudata	coast woolly-heads	Polygonaceae	annual herb	1B.2	S2.2	G3G4T3?
Nemacladus gracilis	slender nemacladus	Campanulaceae	annual herb	4.3	S3.3	G3
Nemacladus secundiflorus var. robbinsii	Robbins' nemacladus	Campanulaceae	annual herb	1B.2	S2S3	G3T2T3
Opuntia basilaris var. brachyclada	short-joint beavertail	Cactaceae	perennial stem succulent	1B.2	S3	G5T3
Opuntia basilaris var. treleasei	Bakersfield cactus	Cactaceae	perennial stem succulent	1B.1	S1	G5T1
Orcuttia californica	California Orcutt grass	Poaceae	annual herb	1B.1	S1	G1
Oreonana vestita	woolly mountain-parsley	Apiaceae	perennial herb	1B.3	S3	G3
Orobanche parishii ssp. brachyloba	short-lobed broomrape	Orobanchaceae	perennial herb (parasitic)	4.2	S3.2	G4?T3
Orobanche valida ssp. valida	Rock Creek broomrape	Orobanchaceae	perennial herb (parasitic)	1B.2	S2	G3T2
Oxytropis oreophila var. oreophila	rock-loving oxytrope	Fabaceae	perennial herb	2B.3	S2	G5T4
Packera bernardina	San Bernardino ragwort	Asteraceae	perennial herb	1B.2	S2	G2
Packera ionophylla	Tehachapi ragwort	Asteraceae	perennial herb	4.3	S3.3	G3
Parnassia cirrata var. cirrata	San Bernardino grass-of-Parnassus	Parnassiaceae	perennial herb	1B.3	S2.3	G5T2
Pentachaeta aurea ssp. aurea	golden-rayed pentachaeta	Asteraceae	annual herb	4.2	S3	G4T3
Pentachaeta lyonii	Lyon's pentachaeta	Asteraceae	annual herb	1B.1	S2	G2
Perideridia gairdneri ssp. gairdneri	Gairdner's yampah	Apiaceae	perennial herb	4.2	S3.2	G5T3
Perideridia pringlei	adobe yampah	Apiaceae	perennial herb	4.3	S3.3	G3
Phacelia exilis	Transverse Range phacelia	Boraginaceae	annual herb	4.3	S3.3	G3Q
Phacelia hubbyi	Hubby's phacelia	Boraginaceae	annual herb	4.2	S3.2	G3
Phacelia mohavensis	Mojave phacelia	Boraginaceae	annual herb	4.3	S3.3	G3Q
Phacelia ramosissima var. austrolitoralis	south coast branching phacelia	Boraginaceae	perennial herb	3.2	S3.2	G5?T3
Phacelia stellaris	Brand's star phacelia	Boraginaceae	annual herb	1B.1	S1	G1
Pickeringia montana var. tomentosa	woolly chaparral-pea	Fabaceae	evergreen shrub	4.3	S2S4.3	G5T2T4
Piperia cooperi	chaparral rein orchid	Orchidaceae	perennial herb	4.2	S3.2	G4
	narrow-petaled rein					

Piperia leptopetala	orchid	Orchidaceae	perennial herb	4.3	S3.3	G3
Piperia michaelii	Michael's rein orchid	Orchidaceae	perennial herb	4.2	S3.2	G3
Plagiobothrys parishii	Parish's popcorn-flower	Boraginaceae	annual herb	1B.1	S1	G1
Polygala cornuta var. fishiae	Fish's milkwort	Polygalaceae	perennial deciduous shrub	4.3	S3.3	G5T4
Potentilla multijuga	Ballona cinquefoil	Rosaceae	perennial herb	1A	SX	GX
Pseudognaphalium leucocephalum	white rabbit-tobacco	Asteraceae	perennial herb	2B.2	S2S3.2	G4
Quercus durata var. gabrielensis	San Gabriel oak	Fagaceae	perennial evergreen shrub	4.2	S3.2	G4T3
Quercus engelmannii	Engelmann oak	Fagaceae	perennial deciduous tree	4.2	S3.2	G3
Ribes divaricatum var. parishii	Parish's gooseberry	Grossulariaceae	perennial deciduous shrub	1A	SH	G4TH
Ribes viburnifolium	Santa Catalina Island currant	Grossulariaceae	perennial evergreen shrub	1B.2	S2?	G2?
Romneya coulteri	Coulter's matilija poppy	Papaveraceae	perennial rhizomatous herb	4.2	S3.2	G3
Rupertia rigida	Parish's rupertia	Fabaceae	perennial herb	4.3	S3.3	G3
Scutellaria bolanderi ssp. austromontana	southern mountains skullcap	Lamiaceae	perennial rhizomatous herb	1B.2	S2	G4T2
Selaginella asprella	bluish spike-moss	Selaginellaceae	perennial rhizomatous herb	4.3	S3.3	G4G5
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	2B.2	S2	G3?
Senecio astephanus	San Gabriel ragwort	Asteraceae	perennial herb	4.3	S3	G3
Sidalcea neomexicana	salt spring checkerbloom	Malvaceae	perennial herb	2B.2	S2S3	G4?
Sidotheca caryophylloides	chickweed oxytheca	Polygonaceae	annual herb	4.3	S3.3	G3
Stylocline masonii	Mason's neststraw	Asteraceae	annual herb	1B.1	S1	G1
Suaeda esteroa	estuary seablite	Chenopodiaceae	perennial herb	1B.2	S2	G3
Suaeda taxifolia	woolly seablite	Chenopodiaceae	perennial evergreen shrub	4.2	S2S3	G3?
Symphyotrichum defoliatum	San Bernardino aster	Asteraceae	perennial rhizomatous herb	1B.2	S2	G2
Symphyotrichum greatae	Greata's aster	Asteraceae	perennial rhizomatous herb	1B.3	S2.3	G2
Syntrichopappus lemmonii	Lemmon's syntrichopappus	Asteraceae	annual herb	4.3	S3.3	G3
Thelypteris puberula var. sonorensis	Sonoran maiden fern	Thelypteridaceae	perennial rhizomatous herb	2B.2	S2.2?	G5T3
Thermopsis californica var. argentata	silvery false lupine	Fabaceae	perennial rhizomatous herb	4.3	S3.3	G3T3
Thysanocarpus rigidus	rigid fringepod	Brassicaceae	annual herb	1B.2	S1S2	G1G2
Tortula californica	California screw-moss	Pottiaceae	moss	1B.2	S2	G2?

Viola pinetorum var. grisea	grey-leaved violet	Violaceae	perennial herb	1B.3	S3?	G4G5T3?
Viola purpurea ssp. aurea	golden violet	Violaceae	perennial herb	2B.2	S2S3	G5T2T3

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Plant List

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Search Criteria

Found in San Clemente Island or Santa Catalina Island

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Abronia maritima	red sand-verbena	Nyctaginaceae	perennial herb	4.2	S3?	G4?
Acmispon argophyllus var. adsurgens	San Clemente Island bird's-foot trefoil	Fabaceae	perennial herb	1B.1	S1	G5T1
Acmispon dendroideus var. dendroideus	island broom	Fabaceae	perennial shrub	4.2	S3.2	G4T3
Acmispon dendroideus var. traskiae	San Clemente Island lotus	Fabaceae	perennial shrub	1B.1	S2	G4T2
Aphanisma blitoides	aphanisma	Chenopodiaceae	annual herb	1B.2	S3	G3G4
Arctostaphylos catalinae	Santa Catalina Island manzanita	Ericaceae	perennial evergreen shrub	1B.2	S2?	G2?
Artemisia nesiotica	island sagebrush	Asteraceae	perennial evergreen shrub	4.3	S3.3	G3
Astragalus miguelensis	San Miguel Island milk -vetch	Fabaceae	perennial herb	4.3	S3.3?	G3
Astragalus nevinii	San Clemente Island milk-vetch	Fabaceae	perennial herb	1B.2	S3	G3
Atriplex coulteri	Coulter's saltbush	Chenopodiaceae	perennial herb	1B.2	S2	G2
Atriplex pacifica	South Coast saltscale	Chenopodiaceae	annual herb	1B.2	S2	G3G4
Atriplex serenana var. davidsonii	Davidson's saltscale	Chenopodiaceae	annual herb	1B.2	S1	G5T1
Bergerocactus emoryi	golden-spined cereus	Cactaceae	perennial stem succulent	2B.2	S2	G2
Brodiaea kinkiensis	San Clemente Island brodiaea	Themidaceae	perennial bulbiferous herb	1B.2	S2	G2
Calochortus catalinae	Catalina mariposa lily	Liliaceae	perennial bulbiferous herb	4.2	S3.2	G3
Calystegia macrostegia ssp. amplissima	island morning-glory	Convolvulaceae	perennial herb	4.3	S3.3	G4G5T3
Camissoniopsis guadalupensis ssp. clementina	San Clemente Island evening-primrose	Onagraceae	annual herb	1B.2	S3	G3T3
Castilleja grisea	San Clemente Island paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	1B.3	S3	G3
Ceanothus megacarpus var. insularis	island ceanothus	Rhamnaceae	perennial evergreen shrub	4.3	S3.3	G5T3
Centromadia parryi ssp. australis	southern tarplant	Asteraceae	annual herb	1B.1	S2	G3T2

Cercocarpus betuloides var. blancheae	island mountain-mahogany	Rosaceae	perennial evergreen shrub	4.3	S3.3	G5T3
Cercocarpus traskiae	Catalina Island mountain-mahogany	Rosaceae	perennial evergreen shrub	1B.1	S1	G1
Cistanthe maritima	seaside cistanthe	Montiaceae	annual herb	4.2	S3.2	G3G4
Constancea nevinii	Nevin's woolly sunflower	Asteraceae	perennial deciduous shrub	1B.3	S4	G4
Convolvulus simulans	small-flowered morning-glory	Convolvulaceae	annual herb	4.2	S3.2	G3
Crocanthemum greenei	island rush-rose	Cistaceae	perennial evergreen shrub	1B.2	S2	G2
Crossosoma californicum	Catalina crossosoma	Crossosomataceae	perennial deciduous shrub	1B.2	S2	G2
Cryptantha traskiae	Trask's cryptantha	Boraginaceae	annual herb	1B.1	S2	G2
Deinandra clementina	island tarplant	Asteraceae	perennial deciduous shrub	4.3	S3.3	G3
Delphinium variegatum ssp. kinkiense	San Clemente Island larkspur	Ranunculaceae	perennial herb	1B.1	S2	G4T2
Delphinium variegatum ssp. thornei	Thorne's royal larkspur	Ranunculaceae	perennial herb	1B.1	S2	G4T2
Dendromecon harfordii var. rhamnoides	south island bush-poppy	Papaveraceae	perennial evergreen shrub	3.1	S1	G4T1Q
Dichondra occidentalis	western dichondra	Convolvulaceae	perennial rhizomatous herb	4.2	S3.2	G4?
Dissanthelium californicum	California dissanthelium	Poaceae	annual herb	1B.2	S1	G1
Dithyrea maritima	beach spectaclepod	Brassicaceae	perennial rhizomatous herb	1B.1	S2.1	G2
Dudleya greenei	Greene's dudleya	Crassulaceae	perennial herb	4.2	S3.2	G3
Dudleya virens ssp. hassei	Catalina Island dudleya	Crassulaceae	perennial herb	1B.2	S2?	G3?T2?
Dudleya virens ssp. insularis	island green dudleya	Crassulaceae	perennial herb	1B.2	S3	G3?T3
Dudleya virens ssp. virens	bright green dudleya	Crassulaceae	perennial herb	1B.2	S1	G3?T1
Eriogonum giganteum var. formosum	San Clemente Island buckwheat	Polygonaceae	perennial deciduous shrub	1B.2	S3	G3T3
Eriogonum giganteum var. giganteum	Santa Catalina Island buckwheat	Polygonaceae	perennial evergreen shrub	4.3	S3	G3T3
Eriogonum grande var. grande	island buckwheat	Polygonaceae	perennial herb	4.2	S3.2	G3T3
Eschscholzia ramosa	island poppy	Papaveraceae	annual herb	4.3	S3.3	G3
Euphorbia misera	cliff spurge	Euphorbiaceae	perennial shrub	2B.2	S2	G5
Galium catalinense ssp. acrispum	San Clemente Island bedstraw	Rubiaceae	perennial deciduous shrub	1B.2	S2	G4T2
Galium catalinense ssp. catalinense	Santa Catalina Island bedstraw	Rubiaceae	perennial deciduous shrub	1B.2	S2S3	G4T2T3
Galium nuttallii ssp. insulare	Nuttall's island bedstraw	Rubiaceae	perennial herb	4.3	S3.3	G5?T3
Gambelia speciosa	showy island snapdragon	Plantaginaceae	perennial shrub	1B.2	S3	G3
Gilia nevinii	Nevin's gilia	Polemoniaceae	annual herb	4.3	S3.2	G3

Graphis saxorum	Baja rock lichen	Graphidaceae	crustose lichen (saxicolous)	3	S1S3	G1G3
Harpagonella palmeri	Palmer's grapplinghook	Boraginaceae	annual herb	4.2	S3.2	G4
Hazardia cana	San Clemente Island hazardia	Asteraceae	perennial evergreen shrub	1B.2	S2	G2
Hordeum intercedens	vernal barley	Poaceae	annual herb	3.2	S3S4	G3G4
Isocoma menziesii var. decumbens	decumbent goldenbush	Asteraceae	perennial shrub	1B.2	S2	G3G5T2T3
Jepsonia malvifolia	island jepsonia	Saxifragaceae	perennial herb	4.2	S3.3	G3
Lavatera assurgentiflora ssp. glabra	southern island mallow	Malvaceae	perennial evergreen shrub	1B.1	S1	G1T1
Lepechinia fragrans	fragrant pitcher sage	Lamiaceae	perennial shrub	4.2	S3.2	G3
Leptosiphon pygmaeus ssp. pygmaeus	pygmy leptosiphon	Polemoniaceae	annual herb	1B.2	S1	G4T1
Lithophragma maximum	San Clemente Island woodland star	Saxifragaceae	perennial rhizomatous herb	1B.1	S1	G1
Lomatium insulare	San Nicolas Island lomatium	Apiaceae	perennial herb	1B.2	S2S3	G2G3
Lonicera subspicata var. subspicata	Santa Barbara honeysuckle	Caprifoliaceae	perennial evergreen shrub	1B.2	S2	G5T2
Lupinus guadalupensis	Guadalupe Island lupine	Fabaceae	annual herb	4.2	S3	G3
Lycium brevipes var. hassei	Santa Catalina Island desert-thorn	Solanaceae	perennial deciduous shrub	1B.1	S1	G1Q
Lycium californicum	California box-thorn	Solanaceae	perennial shrub	4.2	S3.2	G4
Lyonothamnus floribundus ssp. aspleniifolius	Santa Cruz Island ironwood	Rosaceae	perennial evergreen tree	1B.2	S3	G3T3
Lyonothamnus floribundus ssp. floribundus	Santa Catalina Island ironwood	Rosaceae	perennial evergreen tree	1B.2	S2	G3T2
Malacothamnus clementinus	San Clemente Island bush-mallow	Malvaceae	perennial deciduous shrub	1B.1	S2	G2
Malacothrix foliosa ssp. foliosa	leafy malacothrix	Asteraceae	annual herb	4.2	S3.2	G4T3
Malacothrix incana	dunedelion	Asteraceae	perennial herb	4.3	S3.3	G3
Microseris douglasii ssp. platycarpha	small-flowered microseris	Asteraceae	annual herb	4.2	S3.2	G4T3
Mimulus flemingii	island bush monkeyflower	Phrymaceae	perennial evergreen shrub	4.3	S3.3	G3Q
Mimulus traskiae	Santa Catalina Island monkeyflower	Phrymaceae	annual herb	1A	SX	GX
Muhlenbergia appressa	appressed muhly	Poaceae	annual herb	2B.2	S3	G4
Munzothamnus blairii	Blair's munzothamnus	Asteraceae	perennial shrub	1B.2	S2.2	G2
Nama stenocarpum	mud nama	Boraginaceae	annual / perennial herb	2B.2	S1S2	G4G5
Nemacaulis denudata var. denudata	coast woolly-heads	Polygonaceae	annual herb	1B.2	S2.2	G3G4T3?
Orobanche parishii ssp. brachyloba	short-lobed broomrape	Orobanchaceae	perennial herb (parasitic)	4.2	S3.2	G4?T3
Pentachaeta lyonii	Lyon's pentachaeta	Asteraceae	annual herb	1B.1	S2	G2

Phacelia floribunda	many-flowered phacelia	Boraginaceae	annual herb	1B.2	S2	G2
Piperia cooperi	chaparral rein orchid	Orchidaceae	perennial herb	4.2	S3.2	G4
Quercus engelmannii	Engelmann oak	Fagaceae	perennial deciduous tree	4.2	S3.2	G3
Quercus pacifica	island scrub oak	Fagaceae	perennial evergreen shrub	4.2	S3.2	G3
Quercus tomentella	island oak	Fagaceae	perennial evergreen tree	4.2	S3.2	G3
Rhamnus pirifolia	island redberry	Rhamnaceae	perennial evergreen tree	4.2	S3.2	G3
Ribes viburnifolium	Santa Catalina Island currant	Grossulariaceae	perennial evergreen shrub	1B.2	S2?	G2?
Scrophularia villosa	Santa Catalina figwort	Scrophulariaceae	perennial shrub	1B.2	S3	G3
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	2B.2	S2	G3?
Sibara filifolia	Santa Cruz Island winged-rockcress	Brassicaceae	annual herb	1B.1	S1	G1
Solanum wallacei	Wallace's nightshade	Solanaceae	perennial herb	1B.1	S2.1	G2Q
Suaeda taxifolia	woolly seablite	Chenopodiaceae	perennial evergreen shrub	4.2	S2S3	G3?
Texosporium sancti-jacobi	woven-spored lichen	Caliciaceae	crustose lichen (terricolous)	3	S1	G3
Trifolium palmeri	southern island clover	Fabaceae	annual herb	4.2	S3.2	G3
Triteleia clementina	San Clemente Island triteleia	Themidaceae	perennial bulbiferous herb	1B.2	S2	G2

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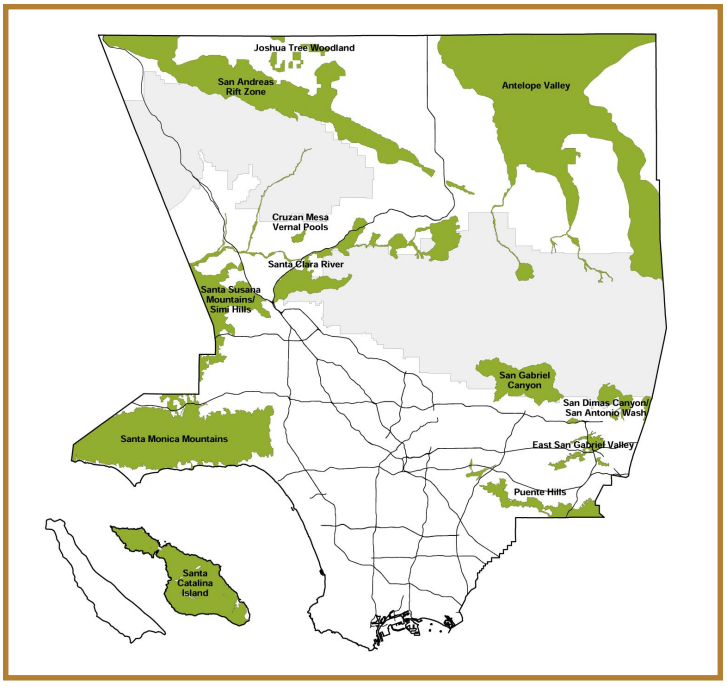
Los Angeles County Significant Ecological Area Update Study 2000



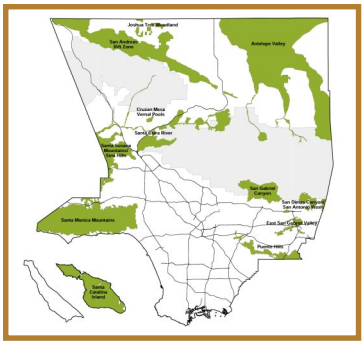
Background Report

Los Angeles County, California

November 2000

PCR

Los Angeles County Significant Ecological Area Update Study 2000



Background Report

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Los Angeles County, California

November 2000

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EXECUTIVE SUMMARY

The Los Angeles County Significant Ecological Area (SEA) Study has three purposes: To evaluate existing SEAs for changes in biotic conditions and consider additional areas for SEA status within unincorporated Los Angeles County; to delineate SEA boundaries based upon biotic evaluation; and to propose guidelines for managing and conserving biological resources within these areas.

The "original" SEA report was prepared in 1972 by a committee of scientists from the Los Angeles County Museum of Natural History and local academic institutions. This was done as a background study for the 1973 County General Plan. A second SEA study was completed in 1976 by England and Nelson, Environmental Consultants. The 61 SEAs existing today represent the findings of the 1976 Study, as amended through the adoption of a revised General Plan in 1980. After 20 years, it is necessary to re-evaluate the SEA program as part of the next General Plan amendment.

As in 1976, the underlying objective of the SEA program remains the preservation of biotic diversity. Following this objective, it is crucial to identify and designate as proposed SEAs areas that possess examples of biotic resources that cumulatively represent biological diversity. Equally important, this objective has been expanded to include the future sustainability of this diversity through the application of more current practices in conservation planning, primarily by consolidation into larger interconnected SEAs.

The criteria used to identify prospective SEAs were similar to those used in 1976 by England and Nelson. Of the original eight criteria, minor modifications were made to one, and two were omitted from this study without loss to the range of biological diversity subject to this study. The methods used to identify and delineate proposed SEAs was multi-faceted, including: a broad outreach program focused in the government resource agencies, academic institutions, conservation groups, and the general public; a comprehensive database and literature review; an evaluation of existing SEAs in the unincorporated County; the interpretation of aerial photography; and, field study.

The SEA study focused on existing SEAs, within the unincorporated county jurisdiction, and areas nominated for SEA status. Significant Ecological Areas located within cities were not studied, though this analysis recommends that the boundaries of these areas be retained. Significant Ecological Areas remaining within the unincorporated area were consolidated into twelve new areas. These areas were connected to enhance sustainability and biological diversity. As a consequence, the proposed acreage of these areas covers a total of 442,983 acres (unincorporated). This is a

substantial increase in comparison to the 176,174 acres (unincorporated) of SEAs previously designated in 1980 County General Plan.

The proposed SEAs in this study were based on scientifically-grounded concepts regarding their size and connectivity. Most do not focus on a single resource or habitat type. Where feasible, these areas form linkage systems which should greatly improve the probability of achieving the expanded objectives of this study, the preservation of biological diversity in Los Angeles County.

LOS ANGELES COUNTY SEA UPDATE STUDY 2000
BACKGROUND REPORT

1. INTRODUCTION

1.1 PURPOSE

The Los Angeles County General Plan provides guidelines and policies for decision-making regarding new development. As mandated by the State of California, every city and county must adopt and periodically update a comprehensive long-range general plan for physical development within its jurisdiction. The elements of this plan include land use, circulation, housing, safety and noise, open space, and conservation. As part of its General Plan Conservation/Open Space and Land Use elements, Los Angeles County has identified and adopted policies for "Significant Ecological Areas" (SEAs) for certain areas. It has been 20 years, however, since elements of the General Plan, including the SEA component, were last updated.

The purpose of this study is three-fold: First, the study evaluates existing SEAs and additional areas considered for SEA status within unincorporated Los Angeles County. This includes a biotic assessment of existing SEAs for changing conditions, and an evaluation of areas nominated for potential SEA designation. A primary focus of this evaluation is the diversity of ecological resources and potential long-term sustainability. Second, based upon the biotic evaluation, SEA boundaries are delineated to reflect existing conditions or to include additional areas identified with significant ecological resources. Third, this study revisits SEA policies in the Los Angeles County General Plan to propose updated guidelines for managing and conserving resources within these areas. SEAs within city boundaries were not studied, though the analysis recommends that these areas be retained.

1.2 BACKGROUND AND HISTORY

The "original" Significant Ecological Areas report was prepared in 1972 by a committee of scientists from the University of California, Los Angeles, the Los Angeles County Museum of Natural History, and other local academic institutions. That study addressed significant ecological areas that warranted special consideration, due to their high biological resource value. The study served as background for the 1973 Los Angeles County General Plan. The result of that effort was the identification and delineation of 81 such areas throughout the County, including consideration of areas in the Channel Islands and Angeles National Forest.

In 1976, a second study was undertaken by England & Nelson, Environmental Consultants as part of the General Plan revision program. For purposes of this effort the Channel Islands and the Angeles National Forest were excluded from the study. At the conclusion of their work England and Nelson identified 62 SEAs in unincorporated Los Angeles County. Subsequently, the county found it necessary to add two SEAs and delete three others prior to the approval of its revised General Plan in 1980. There are currently 61 existing SEAs designated in the county General Plan. These areas are shown in Figure 1, *Existing Boundaries*, on page 3.

Since their adoption in 1980, Los Angeles County has attempted to update the status of existing SEAs. In 1991 the County hired the consulting firm of Michael Brandman Associates to evaluate seven selected SEAs and complete what is referred to as the "Phase I SEA Study." In addition, de facto evaluations and status monitoring have been provided in the form of biological assessments for individual projects within SEAs. This has been done through the County's Significant Ecological Area Technical Advisory Committee (SEATAC) as part of the County's environmental review process. However, these updates did not include evaluations of all SEAs (as in the case of the Phase I SEA Study); nor, did these studies evaluate entire SEAs.

1.3 GEOGRAPHICAL SCOPE

Los Angeles County possesses an extremely diverse topography. Within its approximately 4,000 square miles, it contains coastal areas, islands, plains, mountains, and desert. Elevations within the County range from sea level to over 10,000 feet. Climates range from mild near the coast, to severe in the high mountains and in the desert. Similarly, soils and underlying geology vary according to prehistoric volcanic activity, marine sedimentation and river deposition. This wide variation in physical environments has produced the very unique and diverse collection of biological resources found in the County today.

The geographical scope of this study encompassed all biological resources within the unincorporated lands of Los Angeles County, including Santa Catalina Island. Lands within incorporated cities, San Clemente Island and the Angeles National Forest were not studied except where existing and prospective SEAs identified within County lands overlapped these jurisdictions. While existing and prospective SEAs entirely within the National Forest or cities were not studied, their designation has been retained.

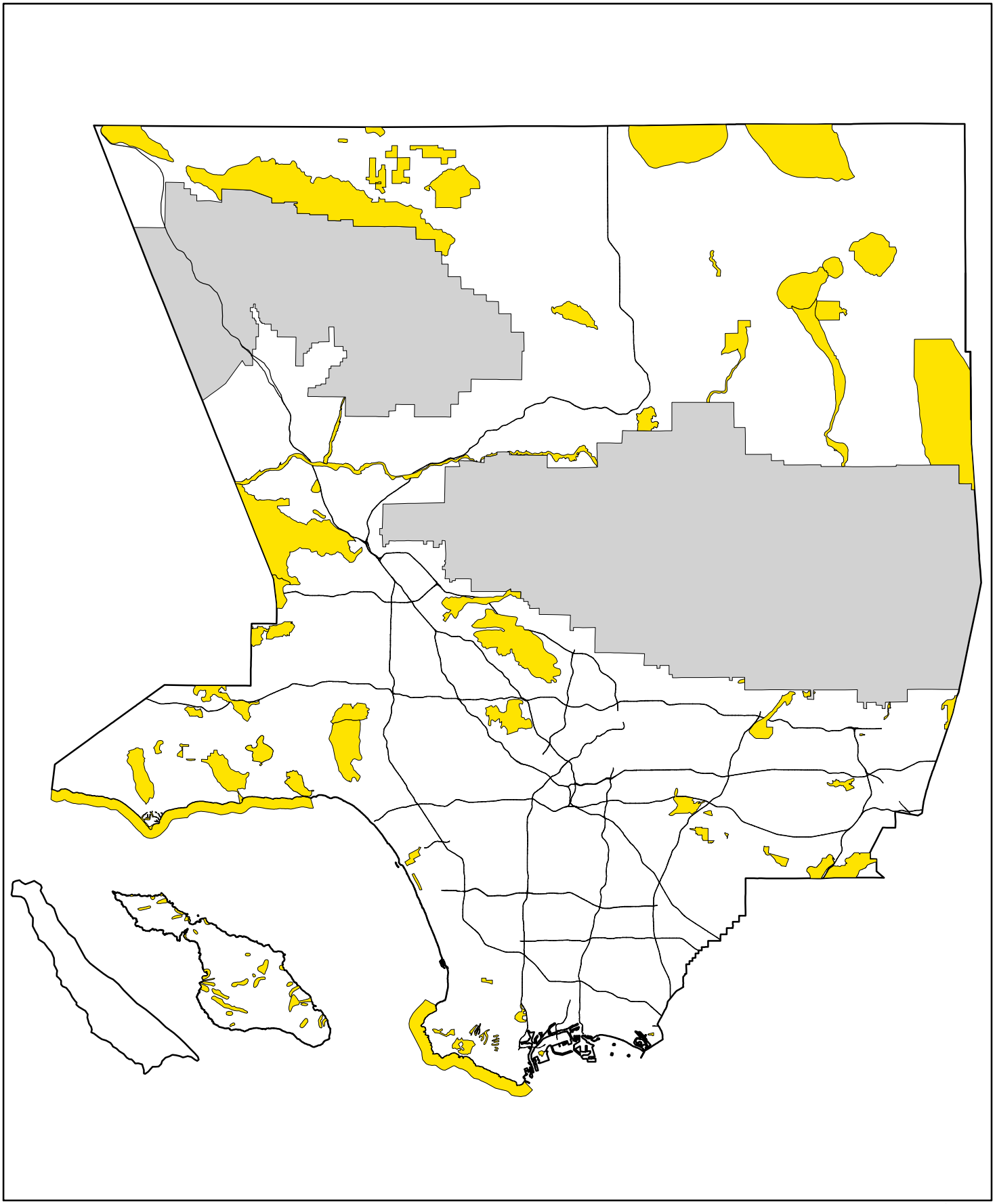

Figure 1

Significant Ecological Areas
Update Study 2000
Existing Boundaries

Existing Significant Ecological Areas
Angeles National Forest

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2. STUDY OBJECTIVES

2.1 A HISTORICAL PERSPECTIVE

The overall objective of the original SEA Study (England and Nelson, 1976), as adopted by Los Angeles County in 1980, was to preserve biological diversity within the areas of County jurisdiction. The England and Nelson study described the County's natural diversity in its introductory chapter, and in its concluding chapter, justified the goal of preserving this diversity. In order to meet this goal, the study sought to identify areas within Los Angeles County which possessed biotic resources which were considered to be uncommon, rare, or unique, were absolutely critical to the maintenance of wildlife, or which represented relatively undisturbed examples of the County's more common habitat types. Such criteria were then used as the basis for designating SEAs.

England and Nelson formulated a set of eight selection criteria with which to classify biological resources and identify SEAs. An extensive literature review was conducted; the 1972 committee of scientists was interviewed; the 81 original SEAs were evaluated; and, a survey questionnaire/nomination form was mailed to a broad list of government agencies, academic institutions, conservation groups and individuals. From these combined efforts a total of 62 SEAs were identified and delineated.

The physical limits determined for each SEA were based upon the data and recommendations received, along with interpretation of topographic maps and high altitude color infrared aerial photography. In general, the boundaries chosen conformed to natural topographic features; however, man-made features and artificial boundaries were used where they coincided with appropriate biological limits. Where SEAs required additional protection from adjacnt land uses, buffer zones were mapped to protect watershed units or to provide distancing from noise, light, traffic and other development impacts. However, the majority of the original SEAs were thought to consist of more or less self-contained units, not in need of additional buffering. It is important to note here, that the underlying ecological concepts employed during the England and Nelson delineations were based upon recently published theories of "island biogeography," which were at that time (1976) prevalent in the emerging field of conservation planning.

Because it was broadly based on published and unpublished information acquired through a comprehensive outreach approach which accessed literature, governmental resource agencies, academia and private conservation groups, the 1976 SEA study provided an adequate basis for the preservation of biotic diversity in the County for many years; and, it established a foundation of thought and early action upon which effective programs to preserve biotic diversity could be built.

However, land use within the County has undergone tremendous growth during the intervening decades, including considerable development within and adjacent to the original SEAs, and as a consequence, many of the original SEAs have been compromised, surrounded or isolated physically by development, resulting in true islands in a sea of land use changes. Additionally, conservation planning knowledge and application processes have changed somewhat in the years since the SEA Study was drafted, and it is clear that the SEA program needs a thorough conceptual review and analysis of the underlying foundations, employing more modern conservation biology perspectives.

The original SEAs served to slow or modify the type of development within their defined boundaries, but over time many of the smaller areas lost the biotic qualities for which they were nominated, and resource values in some larger SEAs may have been reduced or degraded, particularly where all or portions of an SEA no longer lie within the jurisdiction of Los Angeles County. To some extent, the SEA project review process has adjusted to changing conservation strategies and philosophies, generally as a reflection of the knowledge, concerns and abilities of responsible County staff and the SEATAC. However, the static and somewhat isolated physical parameters of the original SEA units limits the abilities of planners and resource agencies to conserve dynamic resources as they occur across the whole of the County landscape.

Increasingly, conservation plans have employed more fluid approaches to conserving the ever-increasing list of sensitive resources (e.g., endangered species, habitats of limited distribution, and "patchy" habitats such as coastal sage scrub). Recalling that the 1976 study applied a pragmatic interpretation of island biogeographic theory to its SEA delineation rationale, the primary principles for determining SEA boundaries were that: 1) species extinction rates are lower on larger islands than smaller islands; and, 2) isolated habitat areas have less opportunity to regain species by recolonization from other areas. These principles have moved from theory to demonstrated fact during the intervening years, but even as we come to understand that conserving intact biotic diversity requires providing very large, physically connected parcels, land use changes were dramatically reducing the natural open space remaining within the County. When England and Nelson translated the early biogeographic concepts into SEA design (that is, that large SEAs were better than small SEAs, and SEAs closer to the National Forest and other expanses of open space were better than SEAs placed farther away), they did not foresee the rates of growth which have occurred within the County, and despite what seemed at the time to be an adequate application of the theory, they created SEAs which have over time proven to be either too small to conserve habitat biodiversity internally, and/or too distant to provide essential connectivity between them.

Another area of concern not anticipated within the 1976 England and Nelson study is the issue of land stewardship outside the development impact areas. Existing SEAs predominantly depend on a custodial management approach, with the County providing oversight on an as-needed

basis. Conservation easements and management agreements now provide a broader spectrum of options to the land owner, and can free the County of undue responsibility after project completion. Such provisions for long-term natural resource custodianship and sustainability were not emphasized in the original SEA study.

2.2 EXPANDED OBJECTIVES

The preservation of biological diversity today, as in 1976, remains a paramount objective of conservation planning for a variety of reasons. Aesthetically, conserved open space adds value to adjacent developed land, and provides an essential environmental buffer between intensive human activity areas. Natural open space near urban areas can function as a visual amenity, a passive recreational asset, a groundwater recharge site, a reservoir for native species populations, and a buffer between development and surrounding larger land use reserves (such as Natural Forests).

More importantly, large natural open space areas can conserve entire habitats and ecosystems intact, preserving species diversity and insuring that native species do not become extinct or endangered. Open space or low-density zoning areas must be of sufficient size to retain all the essential "pieces" of the system, however to function biologically over time, and while absolute size parameters are not known for many systems, as a general rule, larger is better. The story of the "mouse and the fungus" provides a good example of how conserved systems need sufficient space and their component species to function. Until fairly recently, forestry practices traditionally focused upon the growing of trees, often arrayed in plantations which emphasized space utilization rather than natural habitat values, and therefore lacked many animal species. Despite the massive use of fertilizers, herbicides and pesticides, these plantations rarely yield the quality or quantity of wood found in a native forest of similar tree composition. Ecological studies of forest ecosystems were undertaken, and in time it was demonstrated that most trees cannot efficiently extract nourishment directly from the soil, but rather are sustained biologically by a type of external fungi which grow on their root systems and aid in the uptake of nutrients. The spores of these fungi are eaten, but not digested, by native mice, who then distribute them over the forest floor in their fecal pellets, insuring their availability to seedling and sapling trees. The mouse population is held in balance by owls and other small predators, many of which in turn roost, shelter and nest in the trees. This example and many others have demonstrated that long-term preservation of all ecosystem components-- however unassuming in stature-- is essential to the continued existence of our deserts, wetlands, forests and other natural habitat areas.

On a more pragmatic note, several recent medical discoveries have been made wherein chemicals extracted from tree bark and herbaceous plants provided cures for certain types of cancer; a previously unknown perennial corn species, with the potential to save billions of dollars in

replanting costs, was discovered on a hillside being cleared to plant corn, and a compound derived from the blood of horseshoe crabs has proven to be the most effective way to screen for contaminants in drugs, vaccines, artificial limbs and intravenous drips, and now is used in virtually every hospital in America. Other studies have shown that many insect species have the ability to ingest and modify chemical compounds from their toxic host plants, potentially leading to new or improved ways of treating the way humans react to these compounds. New plant and animal species continue to be found in natural habitats within a few miles of major urban centers, and it is clear that we have only begun to understand the genetic, biochemical and physical diversity-- and potential-- of our own urban "backyard."

While the SEA designation is not directly intended to provide such biological services, it is logical to create SEAs which encompass biotic resources cumulatively representing the biodiversity (and yet-to-be-discovered biological potential) of Los Angeles County. These areas must be designed to sustain themselves into the future, genetically and physically. Therefore, the present SEA study focuses on maintaining biodiversity in the long-term by creating boundaries which follow natural biological parameters, embrace habitats, linkages and corridors, and are of sufficient size to support sustainable populations of their component species. Thus, this study attempts to resolve the issue not adequately addressed in the 1976 study by applying updated conservation planning concepts and philosophies to design a series of larger, interconnected SEAs.

3. SELECTION CRITERIA

3.1 1976 CRITERIA

In 1976, England and Nelson developed a set of eight criteria to identify and designate SEAs. An explanation of each criteria is provided in Appendix A, *1976 Criteria for Selecting and Classifying SEAs*.

Class 1 – The habitat of rare, endangered, and threatened plant and animal species.

Class 2 – Biotic communities, vegetative associations, and habitat of plant and animal species that are either one of a kind, or are restricted in distribution on a regional basis.

Class 3 – Biotic communities, vegetative associations, and habitat of plant and animal species that are either one of a kind, or are restricted in distribution in Los Angeles County.

Class 4 – Habitat that at some point in the life cycle of a species or group of species, serves as a concentrated breeding, feeding, resting, or migrating grounds, and is limited in availability.

Class 5 – Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or they represent an unusual variation in a population or community.

Class 6 – Areas important as game species habitat or as fisheries.

Class 7 – Areas that would provide for a preservation of relatively undisturbed examples of the natural biotic communities in Los Angeles County.

Class 8 – Special areas.

The numbering sequence of one through eight has sometimes been misinterpreted as a priority ranking. England and Nelson actually presented these criteria, or classes of resources, in order of increasing availability. In their 1976 report, England and Nelson clearly stated that the classification system should not be interpreted as a measure of the absolute value of the area, but as an index of how close a certain type of resource is to being lost from Los Angeles County.

3.2 UPDATED CRITERIA

Since the adoption of the 1976 SEA Study, as amended in 1980, the jurisdictional status of some SEAs has changed while others have remained relatively stable. From a jurisdictional standpoint, portions or all of many SEAs were actually designated within cities incorporated prior to 1976. In addition, portions or all of several other SEAs became part of city jurisdictions incorporated since 1976. While some of these cities do not formally recognize SEAs by this title in their General Plans and Zoning Ordinances, others afford some degree of sensitivity through open space designations and protective grading guidelines (See Appendix B, *City and County Survey Responses*).

Incorporation of new cities and annexations are expected to continue and are not processes that selection criteria can reasonably foresee and address. Of greater concern and relevance are examples of SEAs which have remained within City and County jurisdictions where biotic diversity has become threatened or locally extinct. According to a study sponsored by the California Native Plan Society (Landis, 1993) at least five of the SEAs designated for their rare plant habitats have suffered from the effects of weed abatement, freeway construction, illegal dumping, development or invasive plants; at least three SEAs designated for unique or restricted plant communities, vegetative

associations and/or habitats have been disturbed by invasive plants; and, ongoing flood control maintenance and development have degraded three others.

In the cases of these SEAs, it is apparent that the criteria correctly identified the types and range of resources comprising biotic diversity in the county; however, the delineation of SEAs in 1976 failed in some cases to identify all of the resources required to sustain this diversity. This has occurred in the previous examples with or without the incorporation of SEAs into cities. As mentioned, some cities recognize the importance of existing SEAs in their General Plans, Zoning Ordinances and special protective grading guidelines; some have also requested the county continue to designate them as SEAs as part of this study.

Having identified sustainability of diversity as a key challenge, this study also recognized that the status of resources has changed since 1980. In drafting revised selection criteria, this study critically reviewed criteria used by England and Nelson. It was determined that the criteria used in 1976 should be modified. Consequently, one criterion was modified and two were deleted altogether. Criterion Class 1 – The Habitat of Rare, Endangered, and Threatened Plant and Animal Species, was modified to address the habitat of "core populations" of such species but not all populations. This was determined to be necessary to recognize many species within Los Angeles County that have been granted protected status since 1976 and key sites where these species may occur throughout the County. It is also important to note that the designation of critical habitat areas and regulation of endangered species acts is under the purview of the U.S. Fish and Wildlife Service (USFWS) and the State Department of Fish and Game (CDFG). Regardless, the recognition of core populations that contribute significantly to the preservation of biotic diversity could be addressed in the County's General Plan policies. Criterion Class 6 – Areas Important As Game Species Habitat or as Fisheries, was omitted. This was due to the questionable contribution of these areas to biotic diversity, in the absence of other criteria, which adequately address resources at the species level. In addition, it was determined that the scope of this study does not include the maintenance of recreation, sport, or other commercial activities as they pertain to biological resources which are regulated by the CDFG. Finally, Criterion Class 8 – Special Areas, was deleted due to its vagueness and the ability of the remaining criteria to encompass its objectives.

As in 1976, a revised draft of selection criteria was distributed for public review. These criteria were sent to resource agencies, conservation groups, local jurisdictions and individual members of the public for review and comment. The review indicated support with minor modifications. A number of the respondents recommended that misrepresentation of resources as prioritized according to the numbered criteria scheme be corrected; and, to apply the criteria not simply to targeted resources, also to areas that afforded long-term sustainability. Hence, in some cases, SEA nominations included large areas often conforming to entire watersheds.

The final SEA selection criteria used in this study are presented in Table 1, *Los Angeles County SEA Update Study 2000 Selection Criteria*, on page 11. The difference between the modified criteria and those used by England and Nelson in 1976 has been described above. For the purpose of this study, updated criteria were used to determine if an existing SEA or candidate SEA should be re-designated or designated as a SEA in the Los Angeles County General Plan. In addition to satisfying a minimum of one criterion, any prospective SEA must lie at least partially within an unincorporated area of Los Angeles County.

Table 1
LOS ANGELES COUNTY SEA UPDATE STUDY 2000 SELECTION CRITERIA

Criterion	Intent/Rationale
A) The Habitat of Core Populations of Endangered or Threatened Plant or Animal Species	These areas are important in maintaining viable plant and/or animal populations for those species recognized by state and or federal resource agencies as being extremely low in numbers or having a very limited amount of suitable habitat available. The terms "endangered" and "threatened" have precise meanings defined in both state and federal law (see below). The identification of "core population"[1] will be determined by the United States Fish & Wildlife Service (USFWS) and the California Department of Fish & Game (CDFG). This criterion is not meant to constitute a recovery program for listed species but rather one element of a more comprehensive conservation effort for the long term sustainment of listed species within the county. At the local level, recovery programs of both the CDFG and the USFWS have measures in place which can impose severe penalties for the "take " of listed species or their habitat. *Federally Endangered:* "any species which is in danger of extinction throughout all or a significant portion of its range …" *Federally Threatened:* "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." *State Endangered:* "…a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease." *State Threatened:* "… a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter [California Code of Regulations, Title 14, Sec 670.5]. Any animal determined by the commission as rare on or before January 1, 1985 is a threatened species."

[1] *The term "core population" as used here is a general biological term referring to a known and/or a viable population. Other locations of endangered or threatened plant or animal species may also occur in Los Angeles County which are not within a SEA. It should also be noted that the concept of core populations is consistent with current thinking of the USFWS and the CDFG.*

Table 1
LOS ANGELES COUNTY SEA UPDATE STUDY 2000 SELECTION CRITERIA
(CONTINUED)

Criterion	Intent/Rationale
B) On a Regional Basis, Biotic Communities, Vegetative Associations, and Habitat of Plant and Animal Species that are either unique, or are restricted in distribution	The purpose of this criterion is to identify biotic resources that are uncommon on a regional basis. The geographical region considered could be as small as the southern California coastal plains, the Transverse mountain ranges, the Mojave Desert, the southern California coastline, etc.; or they could be as large as southern California, the Pacific coast, all of California, the western United States, or even larger. The point being that the community, association, or habitat is either unique or restricted in distribution in an area larger than the political boundaries of Los Angeles County (i.e., coastal sage scrub, native grasslands, or vernal pools). Resources that are limited in distribution in the region being considered, but common elsewhere, are also included under this category.
C) Within Los Angeles County, Biotic Communities, Vegetative Associations, and Habitat of Plant and Animal Species that are either unique, or are restricted in distribution	The purpose of this criterion is to identify biotic resources that are uncommon within the political boundaries of Los Angeles County, regardless of their availability elsewhere. The County has a high diversity of biological components. It and San Diego County are the only counties in the United States that possess coastal, montane, and desert subregions within their boundaries. It is a rich heritage that few local governments have an opportunity to preserve. Many biotic communities that were once common in Los Angeles County have been severely reduced due to urban and agricultural development. This is especially true south of the San Gabriel Mountains, and among the agricultural fields of the North County. Other biotic features have never been common.
D) Habitat that at some point in the life cycle of a species or group of species, serves as Concentrated Breeding, Feeding, Resting, or Migrating Grounds, and is limited in availability either regionally or in Los Angeles County	Species or groups of species, at various points in their life cycles, tend to congregate in certain areas. These areas possess resources that are essential to the maintenance of specific wildlife species. This criterion is intended to identify those areas that are limited in distribution either regionally or in Los Angeles County, and not the primary habitat of common species or groups of species.
E) Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community	Oftentimes scientists learn the most about a biological phenomenon by studying it at an extreme in its distribution. This frequently reveals the biological and ecological parameters under which it can survive. In addition, isolated populations and communities often are relicts of what was present in an area at some previous time, and may show genetic traits not found elsewhere in the species. These biological and ecological parameters may be useful in determining taxonomic relationships.

Table 1
LOS ANGELES COUNTY SEA UPDATE STUDY 2000 SELECTION CRITERIA
(CONTINUED)

Criterion	Intent/Rationale
F) Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities In Los Angeles County	The intent of this criterion was to identify examples of the primary biotic resources in Los Angeles County. At least one example (e.g., native grassland, valley oak savannah) of each vegetation type will be selected from the various geographical regions in the County in order to preserve basic bio-geographic diversity.

Note: Criterion Class 6 from the 1976 SEA study has been omitted in this study due to a lack of biological significance. The scope of the SEA study entails the evaluation of county biological resources which does not include the maintenance of recreation, sport, or otherwise commercial activities. In addition, many of these activities, as they pertain to biological resources, are managed by the CDFG. Criterion Class 8 from the 1976 SEA study has also been omitted due to its vagueness; remaining criteria cover its objective.

4. IDENTIFICATION AND DELINEATION OF PROPOSED SEAs

4.1 OUTREACH PROGRAM

An outreach program served as the first step in identifying prospective SEAs. The program obtained input from interested parties including the general public, governmental resource agencies, and academic institutions. In an effort to notify interested parties, the PCR Project Team and the Los Angeles County Department of Regional Planning (DRP) jointly assembled a mailing list of over 400 entries. In September 1999, each party on the list was mailed a notice that the study had been initiated (copy provided in Appendix C, *SEA Update Study Notice*). The material included: the purpose of the update study and a schedule of public meetings to solicit public comments.

Public meetings hosted by the DRP and assisted by the PCR project team were held in several areas of the County in late September and early August 1999. After a brief summary presentation, comments were received and recorded and a nomination form was distributed (Appendix D, *Public Meeting Materials*). The survey questionnaire/nomination form was also available time through the County website.

The outreach program also gathered input from resource agencies. Meetings were held in the Carlsbad and Ventura offices of the USFWS with regional representatives from the CDFG attending. The main objective of these meetings was to acquire all available information on federal and state listed species within the County. Of particular interest, were locations of core populations of listed species. This information would be used as supporting evidence for one of the revised criteria designations. Secondarily, species account information would be added to sensitive species occurrences within prospective SEAs where applicable. Meetings were also held with resource agencies or groups with a more local focus such as the National Park Service, Whittier Wildlife Corridor Conservation Authority, Catalina Island Conservancy, and the West Mojave Planning Group. Discussions with these groups provided background for review of areas for prospective SEA designation and the eventual boundary delineation.

The final phase of the outreach program consisted of a survey form mailed to all incorporated cities within Los Angeles County that contained entire SEAs or SEA segments within their jurisdictional boundaries (copy of survey questionnaire provided in Appendix E, *City and County Questionnaire Form*). The survey questions focused on determining the extent and condition of biological resources and open space within the city as well as the degree of protection afforded to existing SEAs.

4.2 DATABASE/LITERATURE REVIEW

The second step in the process of identifying prospective SEAs consisted of a thorough literature review. The PCR Project Team started this task by reviewing the year 2000 version of the California Natural Diversity Database covering Los Angeles County. This database provided accounts of sensitive species recorded in the County and was used to support the potential presence of habitats as well. In order to determine the current status of sensitive species, the most recent copies of all listing documents of the USFWS, the CDFG, and the California Native Plant Society were reviewed.

On a more local level, databases and literature that pertained to particular areas of the County were collected from groups focusing on biological resources within those areas. These groups, or agencies, included: National Park Service; Santa Monica Mountains Conservancy; Whittier Wildlife Corridor Conservation Authority; West Mojave Planning Group; Edwards Air Force Base (AFB); Catalina Island Conservancy; Mojave California Poppy Reserve; Frank G. Bonelli Park; and many others. Data including species accounts and vegetation maps gathered from these groups were used to aid in the review and eventual delineation of proposed SEAs in those areas. A complete listing of all sources used in this study is provided in Appendix F, *Comprehensive Study Sources*, of this report.

4.3 EXISTING SEA REVIEW

All existing SEAs in unincorporated Los Angeles County at the time of study were evaluated. The preliminary evaluation of these SEAs consisted of a review of the 1976 SEA Nomination archive files (England and Nelson, 1976). These files included original nomination reports with SEA descriptions, SEA boundaries on USGS topographic maps, and supporting data gathered during the 1976 study.

A second source of literature used to review existing SEAs was previous (SEATAC) biota reports and the Phase 1 SEA Study (Michael Brandman Associates, 1991). The SEATAC reports evaluated potential impacts of proposed projects within existing SEAs and normally included: a description of the SEA; a list of potential sensitive species in the vicinity; a description of the vegetation of the area; current use of the site and adjacent lands; and a list of all species observed. The *Phase 1 SEA Study*, evaluated the condition of seven existing SEAs (No. 6 - Las Virgenes; No. 9 - Cold Creek; No. 10 - Tuna Canyon; No. 15 - Tonner Canyon/Chino Hills; No. 19 - San Francisquito Canyon; No. 45 - Dudleya Desiflora Population, Azusa; No. 61 - Kentucky Springs).

Data obtained from these reports was used in conjunction with ground-truthing field studies (see below) to define the location, extent, and condition of biological resources within each existing SEA. Where applicable, this information was extrapolated to adjacent lands. These data were also used to review the existing SEA boundaries to determine their accuracy and/or potential for recommended modification.

4.4 AERIAL PHOTOGRAPHY

Aerial photos were obtained from two sources to accurately assess biological resources and define boundaries. The DRP provided high resolution, digital, color, ortho-rectified photos taken in the summer of 1999. These images covered most of the existing SEAs in the unincorporated County and some adjacent lands. Photographs of the remaining SEAs in unincorporated County, as well as candidate areas, were acquired from the United States Geological Survey (USGS). These images were high resolution, black and white, digital, ortho-rectified, photos taken five to ten years ago. Approximately 99 percent of the areas encompassed by existing and prospective SEAs were covered aerially. The remaining one percent, mostly within U.S. Forest, was evaluated using USGS Quadrangle maps at 1:24,000 (1" = 2000'). Photographs from both sources were printed and mounted for field use at a scale of 1:12,000 (1" = 1000').

4.5 FIELD STUDY

After reviewing data for existing and prospective SEA areas, field surveys were performed. The objective of the field surveys was to verify the location and evaluate the condition of biological resources previously described in the literature and nomination material. Using mounted aerial photographs as a reference, sites were toured by accessing vantage points which would allow for review of large areas from a single point. Although, not every resource was verified due to the limitations of access to private properties, most areas were field-truthed.

Based on the results of the literature review and field-truthing surveys, preliminary proposed boundaries were formulated and sketched on regional maps. PCR project team biologists next visited each proposed SEA area and refined the boundaries onto aerial photographs. Delineation of the outer boundaries of the proposed SEA's considered many factors. In general they were drawn to include those areas that met the designation criteria and the sustainable biological unit of which they are a part. Most development and other disturbed areas that occurred along the edges of these units were excluded from the SEA. Within the interior of proposed SEAs, only large developments were excluded. After field efforts were completed, boundaries were reviewed and refined a final time to eliminate drawing errors and to ensure the accuracy of the boundary position. The proposed boundaries were then digitized and incorporated in a Geographic Information System (GIS) formatted database.

The final field task involved mapping the vegetative communities within the boundaries of each proposed SEA. Vegetation boundaries were drawn on aerial photographs in the field, then later digitized into the GIS formatted database. Plant communities were classified using standard methodology and terminology. Most of the communities correspond directly with those listed in Holland's Preliminary Descriptions of the Terrestrial Natural Communities of California (1986 and 1992 update). A few communities were classified using standard naming conventions based on dominant species. Where possible, classifications were specific; however, many areas were classified in more general or mixed terms (e.g., riparian, chaparral/coastal sage scrub) due to access limitations. Descriptions of each plant community can be found in the individual proposed SEA reports.

Vegetation maps for two of the proposed SEAs were acquired in digital format from existing sources. The National Park Service provided a map of the Santa Monica Mountains, and the Santa Catalina Island Conservancy provided a map of Santa Catalina Island. These maps were reprojected and printed on USGS topographic maps and reviewed for accuracy. Descriptions of vegetative communities within these SEAs were developed by PCR project team biologists in the field.

Several factors limited the accuracy of field efforts during this study. Access to many areas within unincorporated County is restricted. Some areas within proposed SEAs that were in private property or inaccessible due to terrain or surrounding private property. These areas could only be interpreted from aerial photographs. Secondly, USGS aerial photographs, used in many areas, are out of date and do not reflect land use changes within the last five to ten years. Boundary lines in these areas may not be as precise as others delineated on more recent photographs. Finally, while many areas were mapped using color photographs, the black and white USGS photographs made interpretation of the remaining areas difficult. Designation of community types was particularly difficult with these photographs due to the lack of clear distinctions in gray scale. Although these factors limited the accuracy of the study in some areas, efforts were made wherever possible to increase the precision of the final product.

5. PROPOSED SEAs

5.1 CANDIDATES

The list of candidate SEAs was derived from two primary sources. Initially, the County identified all existing SEAs as candidates with the directive that those SEAs entirely or partially within County unincorporated lands be studied. Those SEAs entirely within incorporated cities were to be retained without further study or modification. The County also identified several areas for consideration that were not existing SEAs but which had been brought to their attention as

candidates by SEATAC members, the County biologist and others. The remaining candidates were obtained through the survey questionnaire/nomination process included in the study's public outreach program. Through this process, numerous additional candidate areas were received for evaluation. A summary of the respondents and their nominations along with this study's response to these nominations is provided in Appendix G, *SEA Nomination Table*.

Nominations were received from the following groups, and individuals: California Native Plant Society, Altadena Foothill Conservancy Planning, Ballona Ecosystem Education Project and Save All of Ballona, Endangered Habitats League, Environment Now, Friends of the Santa Clara River, Los Cerritos Wetlands Task Force, Monrovia Mountain Conservancy, National Audubon Society, Natural History Club of Acton/Agua Dulce, Puente Hills Landfill Native Habitat Conservation Authority, Resource Conservation District of the Santa Monica Mountains, San Gabriel Mountains Regional Conservancy, Santa Monica Mountains Task Force/Sierra Club Chapter, Santa Susana Mountain Park Association, Santa Clarita Organization for Planning the Environment, Sierra Club - Santa Clarity Valley and Santa Clarita Valley Preservation Committee, Sierra Club - Angeles Chapter Conservation Committee, Wildlife Corridor Conservation Authority, The Theodore Payne Foundation for Wildflowers and Native Plants, Inc., and Desert Tortoise Preservation Committee, State of California, Resource Agency - Santa Monica Mountains Conservancy, U.S. Department of Agriculture - National Forest Service - Angeles National Forest, Wilmington Harbor City Harbor Lake Regional Park, U.S. Department of the Interior - National Park Service - Santa Monica Mountains National Recreation Area, U.S. Department of the Interior - Bureau of Land Management - West Mojave Interagency Planning Team, and California Department of Parks and Recreation - Angeles Division, Diamond Bar East Partners, Hacienda Heights Improvement Association, David Brown, Judy Garris, Marcia Scully, and Barbara Wampole. Areas nominated by the respondents varied considerably from modifications to individual existing SEA boundaries to the entire watersheds of major rivers including all tributaries.

5.2 CONCLUSIONS

Twelve SEAs are proposed, based upon this study. These are shown in Figure 2, *Proposed Boundaries*, on page 20. The Proposed SEAs have been designated Antelope Valley, San Andreas Rift Zone, Santa Clara River, Joshua Tree Woodland, Cruzan Mesa Vernal Pools, Santa Susana Mountains/Simi Hills, Santa Monica Mountains, San Gabriel Canyon, San Dimas Canyon/San Antonio Wash, East San Gabriel Valley, Puente Hills, and Santa Catalina Island. In comparison to the approximately 176,174 acres (unincorporated) within the 61 existing SEAs, the twelve proposed SEAs cover approximately 442,983 acres (unincorporated) whereby many existing SEAs are consolidated and linked.

Individual Biological Assessment Reports for each of the proposed SEAs have been prepared under separate covers. These reports include location, description, existing land use, land ownership, vegetation, wildlife, wildlife movement, sensitive resources, regional value, and recommended management practices for each proposed SEA. A list of all plant and animal species potentially occurring within each proposed SEA was also prepared and is included in Appendix H, *Comprehensive Floral and Faunal Compendium*. A summary of the disposition of proposed and existing SEAs is provided in Table 2, *Proposed Versus Existing SEAs*, on page 21. In general, however, proposed changes are the result of incorporating sensitive resource information with current conservation practices.

Recent studies of biological diversity have demonstrated that there are two essential components needed within land use plans to conserve native species and their habitats in an urbanizing environment: sufficient size (of the conservation or open space use area), and connectivity (with other like or supporting systems). Urban "islands" lose biological diversity at a fairly steady rate, commensurate with size (smaller habitat patches losing more, faster), and isolated habitat areas, regardless of size, have less opportunity to regain species by re-colonization from other areas. The distance between habitat areas, and land use within the intervening areas, also influence both the rate of loss and the potential for gain. The criteria used to designate SEAs changed only slightly, but their application was made at a greater scale reflective in part of the changes that have occurred within and around the existing SEAs in the past 25 years.

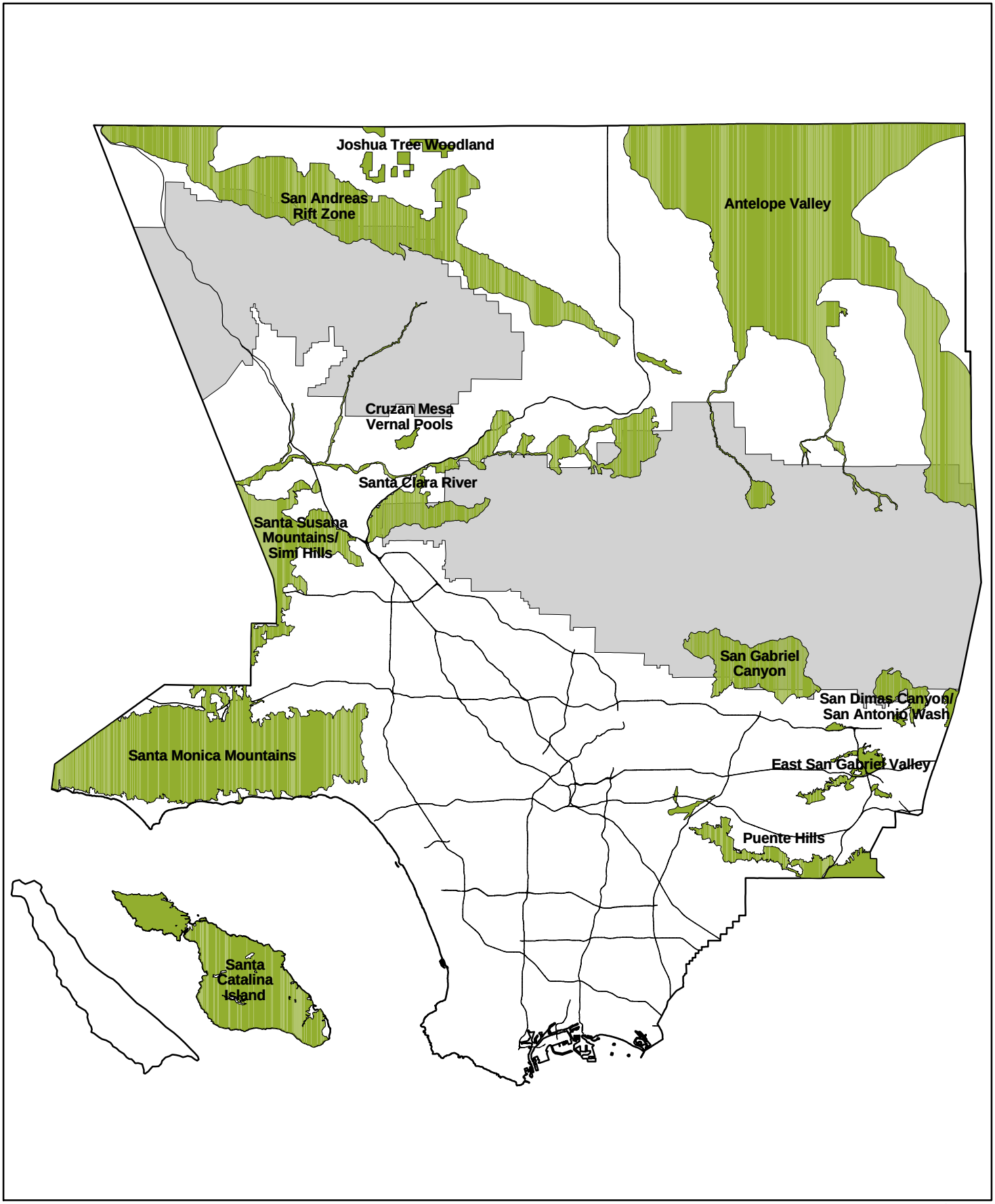

Figure 2

Significant Ecological Areas Update Study 2000 Proposed Boundaries

Proposed Significant Ecological Areas
Angeles National Forest

0 55000 Feet

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Table 2
PROPOSED VERSUS EXISTING SEA BOUNDARIES

Proposed			Existing				Comparison
SEA Name	**Total Acres**	**Uninc. Acres**	**SEA #**	**SEA Name**	**Total Acres**	**Uninc. Acres**	
Santa Monica Mountains	99,430	70,880	3	Zuma Canyon	3,202	≈2,900	Consolidated with proposed Santa Monica Mountains SEA.
			4	Upper La Sierra Canyon	287	287	Consolidated with proposed Santa Monica Mountains SEA.
			5	Malibu Canyon and Lagoon	3,680	≈3,500	Consolidated with proposed Santa Monica Mountains SEA.
			6	Las Virgenes	500	≈250	Consolidated with proposed Santa Monica Mountains SEA.
			7	Hepatic Gulch	15	15	Consolidated with proposed Santa Monica Mountains SEA.
			8	Malibu Creek State Park Buffer Area	245	245	Consolidated with proposed Santa Monica Mountains SEA.
			9	Cold Creek	1,552	1,552	Consolidated with proposed Santa Monica Mountains SEA.
			10	Tuna Canyon	1,491	≈1,350	Consolidated with proposed Santa Monica Mountains SEA.
			11	Temescal-Rustic-Sullivan Canyon	5,702	0	Consolidated with proposed Santa Monica Mountains SEA.
			12	Palo Comado Canyon	2,496	≈1,000	Consolidated with proposed Santa Monica Mountains SEA.
			39	Encino Reservoir	2,071	0	Consolidated with proposed Santa Monica Mountains SEA.
Subtotal	99,430	70,880			21,241	11,099	
Puente Hills	13,421	10,103	15	Tonner Canyon/ Chino Hills	4,145	≈3,950	Consolidated with proposed Puente Hills SEA.
			17	Powder Canyon/Puente Hills	609	≈100	Consolidated with proposed Puente Hills SEA.
			42	Whittier Narrows Dam County Recreation Area	1,585	≈1,300	Consolidated with proposed Puente Hills SEA; except for northerly portions.
			44	Sycamore and Turnball Canyons	607	≈100	Consolidated with proposed Puente Hills SEA.
Subtotal	13,421	10,103			6,946	5,450	

Table 2
PROPOSED VERSUS EXISTING SEA BOUNDARIES
(CONTINUED)

Proposed			Existing				Comparison
SEA Name	**Total Acres**	**Uninc. Acres**	**SEA #**	**SEA Name**	**Total Acres**	**Uninc. Acres**	
East San Gabriel Valley	5,175	722	16	Buzzard Peak/ San Jose Hills	601	≈300	Consolidated with proposed East San Gabriel Valley SEA.
			18	Wayhill	27	0	Studied; not included in proposed SEA due to degraded nature of resources and disjunct location.
Subtotal	5,175	722			628	300	
Santa Clara River	37,774	19,408	19	San Francisquito Canyon	747	≈650	Consolidated with proposed Santa Clara River SEA.
			23	Santa Clara River	4,829	≈3,600	Consolidated with proposed Santa Clara River SEA.
			61	Kentucky Springs	1,490	1,490	Consolidated with proposed Santa Clara River SEA.
Subtotal	37,774	19,408			7,066	5,740	
Santa Susana Mountains/ Simi Hills	26,795	23,425	20	Santa Susana Mountains	18,240	≈17,900	Consolidated with proposed Santa Susana Mountains/Simi Hills SEA.
			21	Santa Susana Pass	1,225	≈750	Consolidated with proposed Santa Susana Mountains/Simi Hills SEA.
			13	Chatsworth Reservoir	1,301	0	Consolidated with proposed Santa Susana Mountains/Simi Hills SEA.
			14	Simi Hills	850	≈800	Consolidated with proposed Santa Susana Mountains/Simi Hills SEA.
			63	Lyon Canyon	171	171	Consolidated with proposed Santa Susana Mountains/Simi Hills SEA.
			64	Valley Oaks Savannah	320	320	Consolidated with proposed Santa Susana Mountains/Simi Hills SEA.
Subtotal	26,795	23,425			22,107	19,941	
San Gabriel Canyon	22,966	128	22	Santa Fe Dam Floodplain	2,125	0	Consolidated with proposed San Gabriel Canyon SEA.

Table 2
PROPOSED VERSUS EXISTING SEA BOUNDARIES
(CONTINUED)

Proposed			Existing				Comparison
SEA Name	**Total Acres**	**Uninc. Acres**	**SEA #**	**SEA Name**	**Total Acres**	**Uninc. Acres**	
			45	Dudleya Densiflora population	151	≈60	Consolidated with proposed San Gabriel Canyon SEA.
			62	Galium Grande Population	84	0	Consolidated with proposed San Gabriel Canyon SEA.
Subtotal	22,966	128			2,360	60	
San Dimas Canyon/San Antonio Wash	6,785	1,568	25	San Dimas Canyon	104	≈15	Consolidated with proposed San Dimas Canyon/San Antonio Wash SEA.
			26	San Antonio Canyon Mouth	766	0	Consolidated with proposed San Dimas Canyon/San Antonio Wash SEA.
Subtotal	6,785	1,568			870	15	
Antelope Valley	222,325	197,634	47	Edwards Air Force Base	17,396	17,396	Consolidated with proposed Antelope Valley SEA.
			48	Big Rock Wash	6,202	6,202	Consolidated with proposed Antelope Valley SEA.
			49	Little Rock Wash	3,225	≈1,300	Consolidated with proposed Antelope Valley SEA.
			50	Rosamond Lake	13,584	13,584	Consolidated with proposed Antelope Valley SEA.
			51	Saddleback Butte State Park	5,362	5,362	Consolidated with proposed Antelope Valley SEA.
			52	Alpine Butte	5,635	≈4,500	Consolidated with proposed Antelope Valley SEA.
			53	Lovejoy Butte	1,955	1,955	Consolidated with proposed Antelope Valley SEA.
			54	Piute Butte	1,295	1,295	Consolidated with proposed Antelope Valley SEA.
			55	Desert Montane Transect	26,775	26,775	Consolidated with proposed Antelope Valley SEA.
Subtotal	222,325	197,634			81,429	78,369	

Table 2
PROPOSED VERSUS EXISTING SEA BOUNDARIES
(CONTINUED)

Proposed			Existing				Comparison
SEA Name	**Total Acres**	**Uninc. Acres**	**SEA #**	**SEA Name**	**Total Acres**	**Uninc. Acres**	
San Andreas Rift Zone	89,698	68,722	56	Ritter Ridge	2,290	≈900	Consolidated with proposed San Andreas Rift Zone SEA
			57	Fairmont and Antelope Buttes	5,567	5,567	Consolidated with proposed San Andreas Rift Zone SEA.
			58	Portal Ridge/ Liebre Mountains	31,063	31,063	Consolidated with proposed San Andreas Rift Zone SEA.
			59	Tehachapi Foothills	4,611	4,611	Consolidated with proposed San Andreas Rift Zone SEA.
Subtotal	89,698	68,722			43,531	42,141	
Joshua Tree Woodland	4,728	4,728	60	Joshua Tree Woodland Habitat	5,760	5,760	Consolidated with proposed Joshua Tree Woodland SEA (existing boundaries do not correspond with proposed SEA due to past mapping error).
Subtotal	4,728	4,728			5,760	5,760	
Santa Catalina Island	46,537	44,707	N/A	Santa Catalina Island	≈7,200	≈7,050	Consolidated with proposed Santa Catalina Island SEA.
Subtotal	46,537	44,707			7,200	7,050	
Cruzan Mesa Vernal Pools	958	958	N/A	N/A	0	0	No existing SEAs within proposed SEA.
Subtotal	958	958			0	0	
N/A			1	Malibu Coastline	11,754	0	Not studied; marine areas not included in study.
			2	Point Dume	275	0	Not studied; entirely within City of Malibu.
			24	Tujunga Valley/Hansen Dam	2,660	0	Not studied; entirely within City of Los Angeles.
			27	Portugese Bend Landside	893	0	Not studied; entirely within City of Rancho Palos Verdes.
			28	El Segundo Dunes	166	0	Not studied; entirely within City of Los Angeles.
			29	Ballona Creek	459	≈140	Not studied; currently being studied by County/City of Los Angeles Local Coastal Program.

Table 2
PROPOSED VERSUS EXISTING SEA BOUNDARIES
(CONTINUED)

Proposed			Existing				Comparison
SEA Name	**Total Acres**	**Uninc. Acres**	**SEA #**	**SEA Name**	**Total Acres**	**Uninc. Acres**	
			30	Alamitos Bay	43	0	Not studied; entirely within City of Long Beach.
			31	Rolling Hills Canyon	520	0	Not studied; entirely within cities of Rolling Hills, Rancho Palos Verdes, and Rolling Hills Estates.
			32	Agua Amarga Canyon	289	0	Not studied; entirely within City of Palos Verde Estate, Rancho Palos Verdes, Rolling Hills Estate.
			33	Terminal Island	87	0	Not studied; entirely within City of Los Angeles.
			34	Palos Verde Peninsula Coastline	8,644	0	Not studied; marine areas not included in study.
			35	Harbor Lake Regional Park	386	0	Not studied; entirely within City of Los Angeles.
			36	Madrona Marsh Total	149	0	Not studied; entirely within City of Torrance.
			37	Griffith Park Total	3,441	0	Not studied; entirely within City of Los Angeles.
			40	Verdugo Mountains	11,554	0	Not studied; entirely within City of Glendale, Burbank, and Los Angeles.
			43	Rio Hondo Wildlife Sanctuary	109	109	Studied; not included in proposed SEA.
Subtotal	N/A	N/A			41,429	249	
GRAND TOTAL	576,592	442,983			240,567	176,174	

Note: Differences between Total Acres and Unincorporated (Uninc.) County acres represents portions of SEAs within incorporated cities and National Forest.

Based on updated evaluation principles, the revised SEAs reflect a more modern and scientifically-grounded concept regarding size and connectivity. Rather than focus on a single resource or habitat type, existing SEAs are connected into a linkage system which should greatly improve the maintenance of critical resources. The SEA designation does not protect biotic resources on land per se, and SEAs are not preserves or conservation areas; rather, SEAs are areas in which planning should be sensitive to resources and maintenance of biological functions as well. By creating larger SEAs, habitat linkage zones are provided between related habitat types (such as the Antelope Valley buttes, or the San Andreas Rift Zone wetlands), and areas of sufficient width, to function as wildlife movement routes between open space areas. The linkages may serve to sustain populational genetic diversity of low-mobility species (such as plants, amphibians, reptiles, rodents), as well as provide refuge areas for migrant species. Corridor routes provide for dispersal between habitat areas by supporting more mobile species. The need for buffer areas has also been eliminated, with SEAs incorporating not only local resources (such as sensitive species) and their habitats, but also the seasonal support habitats for those species, with connections to essential sustaining resource areas (such as corridor areas and hydrological systems). Additionally, potential impacts of non-native species, feral pets, lights, noise, etc., on sensitive habitats have been alleviated by reducing the "edge effect" of urbanization relative to the overall size of the SEAs. In short, by "bridging the current SEA islands" wherever possible, zones of lower intensity human impacts between essential habitat resources have been provided, which help maintain overall species and habitat diversity in Los Angeles County.

6. RECOMMENDATIONS FOR IMPLEMENTATION

6.1 COMPLIANCE WITH FEDERAL AND STATE LAW

Existing federal and state laws mandate the regulatory jurisdiction of government agencies over certain biological resources within SEAs. These include regulation of the following resources: waters and wetlands of the United States (e.g., riparian habitats and most drainages) by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act; federally-listed threatened and endangered species by the USFWS under the federal Endangered Species Act; streambeds, riparian habitats and fisheries by the CDFG under Section 1603 of the California Fish and Game Code; state-listed threatened and endangered species by the CDFG under the California Endangered Species Act; and, water quality by the Regional Water Quality Control Board under Section 401 of the Clean Water Act. The SEA program does not attempt to duplicate these same regulatory programs; rather the implementation of the SEAs is viewed as a complementary program intended to preserve and sustain all biological diversity.

6.2 INTERPRETATION OF MAPPING

The rationale for mapping SEAs was to include, as accurately as possible at 1"=1000' scale, areas of sufficient acreage to ensure that the targeted resources would be sustained into perpetuity. This provides sufficient area for metapopulation stability (e.g., pollinators, water and nutrient supply, genetic exchange, etc.), or to at least provide a broad resource base for the biological elements present, in the event of a natural catastrophe (e.g., fire, flood, etc.) or isolating of the SEA. The margin of error of both the SEA boundaries and the vegetation boundaries at the scale of 1" = 1,000' is subject to several factors: 1) intended location versus actual location of drawn lines; 2) digitizing center versus off center of drawn lines; 3) width of drawn line; and, 4) reprojected coverages. However, the mapping was intended to be interpreted on a project submittal and analysis basis. Therefore, when interpreting SEA boundary maps, the following guidelines are recommended:

- SEA boundaries mapped along natural topographic "breaks", such as a ridge line or toe of slope, were intended to be delineated without variation.

- Boundaries mapped along man-made features, such as a roadway or an aqueduct, were drawn without variation, and are not intended to stray onto such features or cross them unless there is a clear change in boundary direction.

- Boundaries that conform to the edge of urban development were intended to follow the property lines of developed properties, such as the rear or side yard boundary.

- Pre-existing developed portions of properties within SEAs, such as buildings, landscaped areas, and ancillary structures (e.g., barns, corrals), oil field facilities, roadways, utility infrastructure (e.g., water tanks, flood control, electric towers), etc. were not intended as a part of the SEA. Some such features and their maintenance and operation are not subject to SEATAC review. Regardless, due to considerations of mapping scale these features may have been included within SEA boundaries but are recognized as not being biologically sensitive.

6.3 SEATAC REVIEW

As an outgrowth of the 1976 England and Nelson SEA Study, Los Angeles County formed the Significant Ecological Area Technical Advisory Committee. This committee consists of seven members from the private and public sectors with a range of biological expertise. The members are appointed by the DRP Director of Planning to serve staggered three year terms. The primary role of SEATAC is to review projects proposed within SEAs, coordinated by the Department's staff biologist. The Significant Ecological Area Technical Advisory Committee procedures and reporting guidelines provide an additional layer of County review and added scientific rigor to the California

Environmental Quality Act compliance process. The findings of this study support the need to continue and to even increase its activities by virtue of the larger and more complex SEAs proposed. As part of the on-going SEATAC role, the following policies are recommended:

- Clearly stress to users the benefits of completing a Biological Constraints Analysis for SEATAC review prior to developing development plans for a project site (i.e., time and processing savings).

- Eliminate the requirement for small mammal trapping due to the risk associated with hantavirus and other pathogens carried by small mammals; rather, rely on species' range information and habitat evaluations.

- Implement a monitoring program relative to SEA issues and concerns for post-approval construction monitoring, restoration measures and monitoring, and reporting requirements to the DRP staff biologist.

- Require project impact analysis and mitigation measures to fully assess the effects of the project on SEA integrity using the existing SEA Design and Compatibility Guidelines; that is, give it equal consideration and emphasis, under its own heading, as the project site itself.

- Screen project applications within SEAs and exempt projects with nominal effects from further SEATAC review, subject to specific conditions, as appropriate and as developed on a case by case basis. Projects that have undergone SEATAC/environmental review (but may have not been approved) should also be considered in this manner. This would enable SEATAC to focus its time and efforts on projects with potentially substantial effects.

6.4 COMPREHENSIVE LAND USE MANAGEMENT PRACTICES

Land use management guidelines are listed below for all projects within SEAs. These guidelines are proposed to be used in concert with the specific recommended management practices provided in each of the individual SEA reports.

General

It is difficult, if not impossible, to anticipate all potential land uses within SEAs. Therefore, the following recommended guidelines identify by example, rather than an exhaustive listing, general considerations for land uses within SEAs.

- High intensity and/or extensive land uses, by their nature, are not generally compatible with SEA resources. Such uses would include expansive housing tracts, regional commercial and business centers, landfills, quarries, surface mining, etc. Only in cases where key resources (e.g., core habitats, linkages, sensitive resources) are avoided and the dedication of open space is such that overall SEA integrity is preserved should such uses be considered.

- As a general rule, lands within SEAs should be used for low rural density development.

- As a target, development of properties within SEAs should disturb no more than 20 percent of the SEA. Considerations should be given to clustering development and dedicating open space that is contiguous with adjacent open space areas. To the extent feasible, place roads, utilities and other infrastructure within development areas and minimize encroaching into adjacent open space areas.

- Avoiding the intrusion and "spillover" of development effects on adjacent habitat areas should be a primary guiding principle in the design of all projects.

- New landscape plantings in developments, particularly at their perimeters, should avoid the use of invasive plant species and revegetate with native plant species indigenous to the surrounding area.

- All outdoor lighting in SEAs should be shielded and directed away from adjacent open space areas; further, lighting for public health and safety should represent the minimum required to conform to applicable ordinances.

Core Habitats

Many wildlife species, particularly carnivores and other wide ranging species require large areas of suitable habitat for genetically and demographically viable populations. In addition, large contiguous blocks of habitat are more likely to encompass diverse habitat types and are more easily buffered from potential impacts from surrounding developed lands. Most proposed SEAs contain large blocks of habitat generally conforming to a significant topographical feature such as a water-shed, major river, butte, etc. These habitat blocks are referred to as "core habitats." Protecting natural open space (i.e., undeveloped land) within and adjacent to or near these large patches will maintain valuable protected core habitats, which, in turn, can protect larger wildlife populations and potentially generate a greater diversity of species and communities.

- Place primary emphasis on the preservation of large unbroken blocks of natural open space and wildlife habitat (i.e., core habitats).

- Preserve substantial areas of common habitats (e.g., chaparral, non-native grassland) along with sensitive and/or limited habitats (e.g., oak and riparian woodland, coastal sage scrub) within core habitat areas. Retention of common habitats should be designed so as to: buffer sensitive habitats from development; preserve ecotones; and, contribute to long-term functioning of plant and animal communities.

Habitat Linkages and Wildlife Corridors

Within the overall range of a species or suite of species, areas which possess sufficient cover, food, forage, water and other essential elements to serve as a movement pathway, or between two or more larger areas of habitat are referred to as "habitat linkages." An example would be a belt of coastal sage scrub traversing a golf course, and connecting sage scrub habitat areas on either side, providing a "safe passage" zone for smaller, slower-moving species such as lizards and rodents to maintain population connectivity between the two sides of the golf course.

Areas of open space of sufficient width to permit larger, more mobile species (such as foxes, bobcats and coyote) to pass between larger areas of open space, or to disperse from one major open space region to another are referred to as "wildlife corridors." Such areas generally are several hundred feet wide, unobstructed, and usually possess cover, food and water. The upland margins of a creek channel, open ridgelines, or open valleys in the bottoms of drainages often serve as major corridors locally, as do riparian alignments.

- When determining the portions of a development site to be retained in open space, give priority to the preservation of habitat linkages and movement corridors to maintain habitat connectivity.

Habitat connecting core areas together can mitigate the detrimental effects of shrinking habitat availability and wildlife population isolation. Typically, habitat in the SEAs consists of large contiguous blocks (core habitat areas) with intervening areas of open space containing non-native grassland, roads, rural residential, and other low intensity disturbance. A primary goal of any land use within SEAs should be to maintain high levels of connectivity between core habitat areas via a network of linkages and corridors each of which should be no less than 1,000 feet wide. Such linkages should make use of natural topographic features (ridge lines and drainages), vegetative cover (woodlands and scrub), water sources (streams, springs, and ponds), and road undercrossings (bridges and culverts). They may also take advantage of conservation easements, parklands, and preserves.

Also, when reviewing proposed land uses, linkages between core habitats should be analyzed, then be designated, as open space. The following guidelines should be considered.

- Keep road grading and clearance to a minimum; design any necessary roads that cross or enter linkage areas should be designed to minimize alterations to natural terrain and vegetation.

- To the greatest extent feasible and without compromising public safety, design roads within linkages to rural road standards with minimum widths and reduced speed limits.

- Place signs identifying "wildlife crossing area" along roads within linkage areas.

- Where a road crosses a streambed within a linkage area, utilize a bridge-crossing rather than a culvert; enhance vegetation at undercrossing portals to encourage wildlife use.

- Fencing should be discouraged and where needed should not be of a wildlife obstructing nature (e.g., barbed wire, chain link, solid wall), except around the immediate vicinity of residences and associated yards or where public health and safety dictates its use; all other fencing should be "open" in design and structure (e.g., split rail), and not exceeding four feet in height.

- Incorporate vegetative screening and intervening topography into project design and landscaping as buffers for linkages and corridors.

Fire Management

Many standard fuel management practices, some mandated by local and regional fire control agencies, are essentially incompatible with the desired conservation of natural biological resources within SEAs. Practices such as brushing increase erosion, destroy topsoil and native vegetation, and result in the proliferation of invasive, non-native plants. Repeated brushing may completely remove native habitat values, and altered substrates may not recover except over long periods of time without disturbance, and/or costly restoration programs to return a site to a native condition.

- The DRP should confer with the County Fire Department and Forestry and Fire Warden and sensitize them to this issue.

Fire risk reduction measures have the potential to significantly effect and fragment the habitat values of SEAs. Lot sizes of five acres of less can require over four acres of brush clearance, and within a rural residential subdivision, even with a conservation ethic, this can significantly impair natural habitat values and interrupt movement pathways and linkages. Alternative fire management schemes should be seriously explored with the appropriate fire prevention agencies, with consideration given to the following:

- Keep fuel reduction around residential structures to the minimum footprint necessary to insure public and private sector safety, and to comply with insurance requirements.

- For projects within SEAs, the DRP, through the SEATAC process, require fuel management programs which utilize agency-approved vegetation phasing (layering various types of lower-hazard native shrubs and ground-cover species) around the perimeter, and require that larger woody vegetation be thinned and trimmed rather than removed.

- Plan roadwork, fuelbreak creation and maintenance, and other similar activities performed by fire management agencies within SEAs, to reduce impacts to natural resources to the extent possible.

Public Access and Recreation

In general, public access, passive recreational uses and development of future recreation facilities are compatible with SEA management. Significant portions of any public lands proposed for inclusion in SEAs may have been originally acquired by governmental agencies specifically for recreational purposes. Some of these lands already have been developed as a National Recreation Area and County Regional Parks. It should also be stressed that there may be localized areas within SEAs where the biological resources are so sensitive that no access would be appropriate. These areas should be identified at the project level during the SEATAC review process. In addition, the following guidelines are recommended for the design of golf courses:

- Avoid areas supporting sensitive species and/or sensitive habitats (e.g., riparian areas, vernal pools, etc.).

- Incorporate conservation programs such as water and nutrient recycling and avoid changes in hydrology (groundwater and surface).

- Use indigenous native landscaping exclusively and divert runoff containing herbicides, pesticides, and other chemicals from reaching natural water courses and water bodies prior to clarification.

There are many examples of golf courses across the country that have been designed to achieve an “environmental friendly” character. In some cases, golf courses serve as manufactured linkages between habitat reserves. On a case-by-case basis, a new golf course proposed within a SEA should follow avoidance, preservation, and compensation measures, in that order, so the net result is minimal loss in biological resource value and function.

Infrastructure

Certain public infrastructure necessary for public health, safety or welfare may be unavoidable within SEAs. These include: arterial and other identified roads; water lines and associated facilities (e.g., pump stations, pressure control facilities, and access roads), regional water storage and treatment facilities; sewer lines and pump stations; electric, telephone, and natural gas facilities; and storm drain and flood control facilities. The following guidelines are recommended for use in the siting and construction of infrastructure, both existing and proposed, within SEAs.

- To the greatest extent feasible, siting of new infrastructure within SEAs should minimize impacts to natural habitats, and avoid sensitive species.

- Consider flexibility in future design and siting of facilities since many such facilities may not be constructed in the immediate future (e.g., certain arterial roads and water facilities to support growth), and the service environment for public utilities will change over time.

Routine operation and maintenance activities for existing and proposed facilities are to be expected within facility easements. These activities may include: road maintenance; regular patrol and inspection; insulator washing; facility operations; clearing and weed abatement around facilities; routine maintenance and repair of facilities; replacement, rehabilitation and upgrading of facilities; and, other activities mandated by regulation or law affecting public health, safety, and welfare.

For other activities, of a non-routine nature, the following guidelines are recommended:

- Facility operation, maintenance, and repairs that extend outside areas already cleared, should first document existing biological resources in the area to be disturbed using existing or new surveys, to be submitted for review to the DRP staff biologist. A revegetation plan should be prepared, implemented and monitored, by the agency proposing the action. The monitoring results should be submitted for review to the DRP staff biologist.

- Where feasible and consistent with public safety, encourage joint use for public access on infrastructure access roads in order to reduce the need for new trail construction.

- Undertake activities before or after the breeding/nesting season (typically March 15 to June 15).

The following guidelines are recommended to apply to the construction of new facilities.

- To the greatest extent feasible, locate and design infrastructure to minimize or avoid impacts to sensitive resources within SEAs, considering physical and engineering requirements of the proposed infrastructure.

- Design access roads for facilities that minimize disturbance and avoid impacts to sensitive resources. This will generally be the shortest feasible route. The cleared roadbed should be the minimum feasible width taking into account specific slope and safety requirements. Necessary erosion control measures and/or drainage pipes are also recommended.

- Require that a qualified biologist document the resources and vegetation in the area to be disturbed by the proposed facility; use the biological findings to provide the basis for revegetation and monitoring plans.

Wetlands, Riparian Habitats and Streambeds

Many land uses may have adverse effects on the quality, structure, and function of natural streambeds and their associated wetlands and riparian habitats. These uses include urban development, roads, mining, grazing, agriculture, recreational activities, reservoirs and flood control, among others. Because these resources are so critical to healthy ecosystems especially in semi-arid environments such as Los Angeles County, their conservation is considered vital to the long-term maintenance of SEAs.

The inherent functions and values of these habitats within local and regional ecosystems should be retained, such as: their importance to upstream, downstream and surrounding habitat systems; their critical value to migratory birds; their important contribution to habitat linkage and wildlife corridor networks; and their role in maintaining subsurface and surface water quality. For project planning and design purposes for all projects within SEAs resource conservation areas and buffer areas should be established adjacent to wetland, riparian and streambed habitat formations including: riparian and oak riparian woodlands, forests and scrub; desert riparian and wash; vernal pools; marshes, seeps and springs; and natural ponds. The purpose of using this approach is to define preservation areas where uses are excluded within wetland, riparian and streambed habitats (conservation area), plus an adjacent area with limited uses (buffer area). The buffer area serves to reduce impacts to the primary conservation or streamside area to accommodate water quality, fisheries, and terrestrial habitat management requirements. Consideration for resource conservation areas and buffer area setbacks should extend to habitat areas associated with all perennial, intermittent and ephemeral waters. Recommended guidelines to apply this concept are outlined below:

- Establish wetland, riparian and streambed resource conservation areas consisting of the target wetland, riparian and streambed habitat with minimum widths delineated as follows:

  — Riparian and oak riparian scrub, woodlands and forests – at the edge of the riparian vegetation (i.e., the dripline) on either side of the active stream channel; if riparian vegetation is absent or sparse, use the bed and bank of the stream channel.
  — Desert riparian and wash – because the associated riparian vegetation is typically sparse or xeric in life form, use the bed and bank of the active channel inclusive of any braided channel conditions.
  — Vernal pools – use the maximum pool extent.
  — Marshes, seeps and springs – use the edge of the saturated soil.

- Avoid impacts to resource conservation areas associated with channelization, bridge construction, mining and gravel extraction, utility crossings, etc.

- Designate resource conservation areas to be use exclusion areas and prohibit ground disturbing activities and vegetation removal.

- Establish buffer areas adjacent to and around resource conservation areas with minimum buffer setbacks measured from the edge of the resource conservation area as follows:

  — Riparian and oak riparian scrub, woodlands and forests and desert riparian and washes – 300 feet for rivers and streams with resource conservation area width greater than 100 feet; 150 feet for rivers and streams with resource conservation area width 50 to 100 feet; 75 feet for rivers and streams with resource conservation area width less than 50 feet.
  — Vernal pools – 150 feet, or the watershed boundary, whichever is greater.
  — Marshes, seeps and springs – 300 feet for resource conservation area greater than 1 acre; 150 feet for resource conservation area 0.5 to 1 acre; 75 feet for resource conservation area less than 0.5 acre.

- Measure buffer setbacks horizontally, in plan view, since they are intended to serve as spatial buffers; consider lesser setbacks if topography and/or other physical features are determined to provide adequate screening and buffering.

- Designate buffer areas as limited use areas; compatible uses may include agriculture and grazing, passive recreation (hiking, riding, golf and parks with no night lighting), and brush thinning for fire hazard reduction (no removal of trees).

The above guidelines are intended as a general rule for the treatment of wetlands, riparian habitats and streambeds. At times, land uses may necessitate encroachment into the recommended resource conservation areas and buffer areas due to topography or other constraints and road and utility crossings. In these cases the following guidelines are recommended.

- If necessary, encroachment of land uses other than those considered as compatible above should be minimized.
- Crossings of riparian habitats and streambeds should be designed to be as perpendicular as possible to drainage courses in order to minimize resource disturbance.
- Whenever feasible, drainage courses should be bridged with minimal intrusions of abutments and bridge supports into the drainage in order to minimize disturbances and effects on natural surface flow.

Non-riparian/Upland Woodlands

Similar to riparian habitats and streambeds, it is recommended that upland woodlands consisting of oak species, California walnut, joshua tree, native conifers, and cherry (Island and Mainland) be considered sensitive and require avoidance and setback guidelines. Typically, native trees are susceptible to changes in hydrology, soil compaction, impermeable surfaces within their driplines, loss of root systems due to trenching, and other modifications to their integrity and microclimate. Presently, the County administers an oak tree ordinance that has provisions for mitigation of potential impacts and replacement of oak trees but not necessarily oak woodland habitat values. In addition, qualified biologists and certified arborists are available to provide tree-specific recommendations for management. For the purpose of this study, however, these approaches should be followed only after considerations are made for the avoidance of oaks and all other native trees. This is particularly acute when dealing with woodlands that have their own distinct community character and provide unique and valuable habitat for many plant and animal species. Consideration for resource conservation areas and buffer area setbacks should also extend to non-riparian/upland woodlands. Recommended guidelines for this purpose are outlined below.

- Establish non-riparian/upland woodland resource conservation areas with a minimum outer boundary of the dripline of edge trees in the target woodland.
- Designate resource conservation areas as use exclusion areas and prohibit ground disturbing activities and vegetation removal.
- Establish buffer areas adjacent to and around resource conservation areas with minimum buffer setbacks of 150 feet measured from the edge of resource conservation areas.

- Measure buffer setbacks horizontally, in plan view, since they are intended to serve as spatial buffers; consider lesser setbacks if topography and/or other physical features are determined to provide adequate screening and buffering.

- Designate buffer areas as limited use areas; compatible uses include agriculture and grazing, passive recreation (hiking, riding, golf and parks with no night lighting), and brush thinning for fire hazard reduction (no removal of trees).

The above guidelines are intended as a general rule for the treatment of non-riparian/upland woodland habitats. At times, land uses may necessitate encroachment into the recommended resource conservation areas and buffer areas due to topography or other constraints and road and utility placement. In these cases the following guideline is recommended:

- If necessary, encroachment of land uses other than those considered as compatible above should be minimized.

Appendix A

1976 Criteria for Selecting and Classifying SEAs

Criteria for Selecting and Classifying Significant Ecological Areas

CLASS 1 – The habitat of rare, endangered, and threatened plant and animal species.

These areas are important for the maintenance of plant and animal species that are recognized as being either extremely low in numbers or having a very limited amount of habitat available. The terms rare, endangered, and threatened have precise meanings defined in both state and federal law.

State of California

Rare – An animal of a species or subspecies of birds, mammals, fish, amphibia, or reptiles that, although not presently threatened with extinction is in such small numbers throughout its range that it may be endangered if its environment worsens.

Endangered – An animal of a species or subspecies of birds, mammals, fish, amphibia, or reptiles the prospects of which are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

United States Government

Threatened – Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Endangered – Any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary (of the Interior) to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man.

Severe penalties can be imposed for destroying individual organisms or their habitat. The California Department of Fish and Game, and the United States Fish and Wildlife Service publish official lists of rare, endangered, and threatened species. Both agencies recognize mammals, birds, reptiles, and amphibians, but only the Fish and Wildlife Service is empowered to recognize insects and plants.

The literature on rare, endangered, and threatened species is extensive, and increasing all the time. This information was used to identify existing habitat in Los Angeles County.

CLASS 2 – Biotic communities, vegetative associations, and habitat of plant and animal species that are either one of a kind, or are restricted in distribution on a regional basis.

The purpose of this criteria is to identify biotic resources that are uncommon on a regional basis. The geographical region considered could be as small as the southern California coastal plains, the transverse mountain ranges, the Mojave Desert, the southern California coastline, etc; or they could be as large as southern California, the Pacific coast, all of California, the western United States, or even larger. The point being that community, association, or habitat is either unique or restricted in distribution in an area larger than the political boundaries of Los Angeles County. Resources that are limited in distribution in an area larger than the political boundaries of Los Angeles County. Resources that are limited in distribution in the region being considered, but common elsewhere, are also included under this category.

CLASS 3 – Biotic communities, vegetative associations, and habitat of plant and animal species that are either one of a kind, or are restricted in distribution in Los Angeles County.

The purpose of this criteria is to identify biotic resources that are uncommon within the political boundaries of Los Angeles County, regardless of their availability elsewhere. The County has a high diversity of biological components. It and San Diego County are the only counties in the United States that possess coastal, montane, and desert communities within their boundaries. It is a rich heritage that few local governments can attempt to preserve.

Many of the communities that were once common in Los Angeles County have been severely reduced due to urban and agricultural development. This is especially true south of the San Gabriel Mountains, and among the agricultural fields of the north County. Other biotic features have never been common.

CLASS 4 – Habitat that as some point in the life cycle of a species or group of species, serves as a concentrated breeding, feeding, resting, or migrating grounds, and is limited in availability.

Certain areas tend to concentrate a species or group of species at various points in their life cycles. These areas possess specialized characteristics that are essential to the maintenance of wildlife. This criteria is intended to identify those areas that are limited in distribution, and not the specialized habitat of a common species or group of species.

CLASS 5 – Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or they represent an unusual variation in a population or community.

Oftentimes scientists learn the most about biological phenomenon by studying it at an extreme in its distribution. This reveals what the extremes are under which it can survive.

In addition, isolated populations and communities are often relicts of what was present in an area at some previous time, and often show genetic traits not found elsewhere in the species. These characteristics may be useful in determining taxonomic relationships.

CLASS 6 – Areas important as game species habitat or as fisheries.

The criteria was designed to identify areas that are critical to the maintenance of game and fish populations in Los Angeles County.

CLASS 7 – Areas that would provide for the preservation of relatively undisturbed examples of natural biotic communities in Los Angeles County.

The intent of this criteria was to identify examples of the more common biotic resources in Los Angeles County. As often as possible, the areas selected:

1. were completely of nearly undisturbed

2. had a diversity of habitats

3. were large enough to support a representative sample of the native fauna.

4. were more or less isolated from outside impacts, such as a self-contained watershed or isolated mountain peak.

Examples of each vegetation type were selected from the various geographical regions in the County in order to preserve geographic diversity.

CLASS 8 – Special areas.

Certain areas that are worthy of inclusion, but that do not fit any of the above criteria, should be pointed out at this time. Each area has its own special characteristics that are discussed on the individual area description sheets.

APPENDIX B

City and County Survey Responses

Los Angeles County SEA Update Study
City & County Survey Questionnaire

Date Received:	Respondent:	Summary of Comments:	Response:
10-21-99	**City of Claremont** Community Development Department 207 Harvard Avenue Claremont, CA 91711-0880 Contact: Jennifer Craven, Assistant Planner	Remove SEA #26 (San Antonio Canyon Mouth) from the County's list due to approved and built development, as well as, other disturbances to the area.	Due to remaining biological resources of regional significance, principally extensive undisturbed alluvial fan scrub, this SEA is proposed to be retained and consolidated into the proposed San Dimas Canyon/San Antonio Wash SEA.
12-20-99	**City of Diamond Bar** 21660 E. Copley Drive, Suite 100 Diamond Bar, CA 91765-4177 Contact: James DeStefano, Deputy City Manager	Modify the boundaries of SEA #15 (Tonner Canyon/Chino Hills) to include only the area located in the unincorporated County. The City is opposed to any expansion or additional SEAs within City boundaries or its Sphere of Influence. The City maintains a Significant Ecological Area Technical Advisory Committee as a component of its development review and environmental evaluation process. The City also requires development meet special conditions under a Hillside Conditional Use Permit and Hillside Management Ordinance.	Existing SEA #31 has been consolidated with the proposed Puente Hills SEA, including areas within the City and spheres of influence. This is due to the inter-relationship with region-wide ecological systems throughout the Puente/Chino Hills region.
12-01-99	**City of Glendale** 633 E. Broadway, Rm. 103 Glendale, CA 91206-4386 Contact: David Bobardt, Senior Planner	City acknowledges SEA #40 (Verdugo Mountains), in its General Plan Open Space and Conservation Elements, even though a 572-unit development in the SEA is currently pending. Often, most sensitive biological areas are set aside for protection during development review. City's Hillside Ordinance provides further direction on this issue.	Existing SEA #40 was not studied due to its location outside of the unincorporated jurisdiction. Existing SEAs within city boundaries are retained as originally approved.
11-03-99	**City of Glendora** Department of Planning & Redevelopment 116 E. Foothill Boulevard Glendora, CA 91741 Contact: Bill Rodrigues, Assistant Planner	No SEAs are located within the City boundaries, but the General Plan promotes protection of biotic resources, including the San Gabriel Mountains live-forever (*Dudleya densiflora*).	Existing SEA #45 (*Dudleya densiflora* Population) is consolidated into the San Gabriel Canyon SEA which also includes additional areas supporting the species. A portion of existing SEA #45 is located within the City of Glendora. In correspondence dated November 3, 1999, the City noted that areas with *Brodiaea filifolia* are designated Open Space in the zoning and General Plan classifications. The portion within the city will be retained as an SEA.
11-09-99	**City of La Verne** 3660 D Street La Verne, CA 91750 Contact: Hal Frederickson, Community Development Director Ili Lobaco, Graduate Planning Intern	City supports SEA #25 (San Dimas Canyon) and agrees it should continue to be classified as a SEA. City General Plan contains a Resource Management Chapter including policies and implementation measures to address biological resources.	San Dimas Canyon, including the entire existing SEA #25 has been consolidated into the proposed San Dimas Canyon/San Antonio Wash SEA.

Los Angeles County SEA Update Study
City & County Survey Questionnaire

Date Received:	Respondent:	Summary of Comments:	Response:
10-04-99	**City of Long Beach** Planning & Building Department City Hall, Fourth Floor Long Beach, CA 90802	Biotic resources within the City are addressed under the PD (Planned Development) zoning designation. There are no other mechanisms in place.	The City of Long Beach recently acquired Alamitos Bay, an existing SEA, through annexation. This area was not studied due to its location outside of the unincorporated jurisdiction. Existing SEAs within city boundaries are retained as originally approved.
10-20-99	**City of Los Angeles** Los Angeles Department of City Planning 221 South Figueroa, Ste. 210 Los Angeles, CA 90012 Contact: Anne Howell	LA City responses were received on the following existing SEAs: #11 (Temescal/Rustic/Sullivan Canyons), #13 (Chatsworth Reservoir), #14 (Simi Hills), #21 (Santa Susana Pass), #24 (Tujunga Valley/Hansen Dam), #29 (Ballona Creek), #33 (Terminal Island), #35 (Harbor Lake Regional Park), #37 (Griffith Park), #39 (Encino Reservoir), and #40 (Verdugo Mountains). Zoning designations for these SEAs are as follows unless noted otherwise below. Publicly owned land in an SEA is zoned open space, whereas privately owned land in an SEA will have open space, agricultural or very low-density designations. • SEA #24: a portion of the Tujunga Wash has been approved for a golf course. • Delete portions of SEA #28 along the east boundary because it is not included in the habitat protection project for the El Segundo Blue Butterfly. • Portions of SEA #29, Ballona Creek, are proposed or approved for restoration. • A large commercial-residential-recreation-industrial project is approved for a major portion of the area NE of SEA #29. • SEA #29 should be modified to include restoration areas and delete developed areas. • SEA #33 should be deleted because the Least Tern nesting site has been relocated to the outer harbor. • In SEA #35, the area north of Pacific Coast Highway should be deleted due to residential development.	Existing SEAs #11 and #39 have been included within the proposed Santa Monica Mountains SEA. Existing SEAs #13, #14, and #21 have been consolidated into the proposed Santa Susana Mountains/Simi Hills SEA. SEAs #24, #33, #35, #37, and #40 are entirely outside lands within County jurisdiction. Existing SEAs #24, #33, #35, #37 and #40 were not studied due to location of these areas outside of the unincorporated jurisdiction. With exception to SEA #33, existing SEAs within city boundaries are retained as originally approved. SEA #33 (Terminal Island) can be deleted; in correspondence dated October 19, 1999, the City recommended that SEA #33 be relocated to new land created in the outer harbor area. According to the City, this recommendation was made by the U.S. Fish and Wildlife Service, and State Department of Fish and Game. Existing SEA #29, Ballona Creek, was not a part of the study, and it will be retained as originally approved. The analysis of this SEA is undergoing an independent review by a joint County/City of Los Angeles Local Coastal Program study. No changes are proposed to this SEA until an assessment of existing conditions has been completed by this study. Existing SEAs within city boundaries are not a part of the study and are being retained as originally approved. The analysis of this area is also pending an independent review by a joint County/City of Los Angeles Local Coastal Program study. No changes are proposed until an assessment of existing conditions has been completed. Existing SEA #28 will be retained as originally approved.

Los Angeles County SEA Update Study
City & County Survey Questionnaire

Date Received:	Respondent:	Summary of Comments:	Response:
12-15-99	**City of Monrovia** 415 South Ivy Avenue Monrovia, CA 91016-2888 Contact: Robert A. Kastenbaum, Director of Community Development Craig Jimenez, Alice Griselle	City Council approved resolution 99-68 on 12-14-99, nominating the Monrovia Hillside an SEA. This area is located east of Arcadia's City limits, south of the Angeles National Forest and west of Monrovia Canyon Park. The site is approximately 957 acres in size.	The entire area nominated has been consolidated into the proposed San Gabriel Canyon SEA.
02-16-99	**City of Rancho Palos Verdes** 30940 Hawthorne Blvd. Rancho Palos Verdes, CA 90275-5391 Contact: David Snow, Principal Planner	Request the final document note that the SEAs in the City (existing SEA #27 – Portuguese Bend Landslide, #31 – Rolling Hills Canyons, and #32 – Agua Amarga Canyon) do not fall under County regulatory guidelines. Slope regulations, open space hazard zoning, and overlay zones for natural areas are tools that Rancho Palos Verdes uses to protect biotic resources. However, special planning recognition is not directly attributed to SEA designations. In fact, several projects have been approved and two projects are currently pending within the SEAs. The City is currently preparing a Natural Communities Conservation Plan (NCCP).	These SEAs are located outside of the unincorporated area. Existing SEAs within city boundaries are not a part of the study and are being retained as originally approved.
11-02-99	**City of Rolling Hills** No. 2 Portuguese Bend Road Rolling Hills, CA 90274 Contact: Lola Ungar	Preservation of natural habitat in the City is called out in the City's General Plan and reflected in its zoning ordinance. Deeply wooded hillsides and canyons or natural drainages that have also been designated as existing County SEAs are considered Open Space Resources and are defined as Canyon Open Space. Special conditions typically apply to such areas.	Existing SEAs within city boundaries are not a part of the study and are being retained as originally approved.
11-29-99	**City of Santa Clarita** Planning & Building Services 23920 Valencia Blvd., Ste. 300 Santa Clarita, CA 91355-2196 Contact: Jeff Lambert, Director	Recommend approximately 3,800 acres in portions of Placerita, Whitney, Los Pinetos & Elsmere Canyons and Los Pinetos Spring be designated as an SEA.	The subject area is consolidated into the proposed Santa Clara River SEA.
10-20-99	**City of South El Monte** 1415 N. Santa Anita Avenue South El Monte, CA 91733 Contact: Gary Dean Myrick, Director of Community Development	City is unaware of any biotic resources within their boundaries.	Reconfigured SEA #42 will no longer extend into the jurisdiction of South El Monte.

Los Angeles County SEA Update Study
City & County Survey Questionnaire

Date Received:	Respondent:	Summary of Comments:	Response:
11-18-99	**City of Torrance** Planning Department 3031 Torrance Blvd. Torrance, CA 90509-2970 Contact: Tony Gardea	SEA #36 (Madrona Marsh), is maintained as a natural preserve, which was dedicated to the City, but is now smaller than the original SEA due to the Park Del Amo planned development.	Existing SEA #36 is not within the unincorporated area and was not studied. SEAs within city boundaries are retained as originally approved.
12-16-99	**City of Whittier** 13230 Penn Street Whittier, CA 90602-1772 Contact: Thomas Mauk	Whittier City Council passed a resolution urging LA County to restore SEA #44 (Sycamore and Turnbull Canyons) to the original pre-1980 boundaries, incorporating Sycamore Canyon, Dark Canyon, & portions of Turnbull Canyon. Sent follow-up letter regarding SEA #44 and to support for the nominations submitted by Wildlife Corridor Conservation Authority (WCCA).	Consistent with development patterns over the past 20 years, existing SEA #44 has been expanded and consolidated into the proposed Puente Hills SEA. This also corresponds to the nomination submitted by WCCA.
11-04-99	**Kern County** Planning Department 2700 M Street, Suite 100 Bakersfield, CA 93301-2323 Contact: Steve Strait	Kern County does not have a land use designation or other form of program to identify, protect or monitor biological resources.	While Los Angeles County has no jurisdiction to designate SEAs in Kern County, connection with areas of biotic significance outside of Los Angeles County can be accomplished through the proposed San Andreas Rift Zone SEA.

APPENDIX C

SEA Update Study Notice

SEA Meeting Schedule

Dept. of Regional Planning
Commission Hearing Room 150
September 22nd from 2:00 to 5:00 pm
320 W. Temple Street, Los Angeles

Valencia Public Library*
September 23rd from 7:30 to 8:30 pm
23743 W. Valencia Blvd., Santa Clarita

Las Virgenes Municipal* Water District
Board Hearing Room
September 29th from 6:30 to 8:30 pm
4243 Las Virgenes Road, Calabasas

Lancaster Regional Library*
October 12th from 7:00 to 8:00 pm
601 W. Lancaster Blvd., Lancaster

* Please note that these meetings will be preceded by workshops on updating the Housing and Safety Elements of the Los Angeles County General Plan. These meetings may still be in session at the time of your arrival.

General Plan Section
Department of Regional Planning
320 W. Temple Street, 13th Floor
Los Angeles, CA 90012
(213) 974-6417

GENERAL PLAN

The Los Angeles County Department of Regional Planning

invites you to attend a Workshop to update the

Significant Ecological Areas (SEAs) in the County.

Your ideas and comments are welcomed!

Si no entiende este aviso o necesita mas información por favor llame este numero (213) 974-6466

Significant Ecological Area Update Study

The Department of Regional Planning is undertaking a revision of the Los Angeles County General Plan. The General Plan Update devotes special consideration to areas with biologically significant plant or animal species. These Significant Ecological Areas (SEAs) are identified based on biological resources found in the area. Environmental preservation is the fundamental goal behind identifying SEAs. Increased urbanization in Los Angeles County makes the preservation of these resources an important priority. Careful designation of SEAs lead to better land use decisions that maintain a balance between environmental resources and new development.



Meeting Objectives

Due to the ever-changing nature of biological habitats, the County is conducting an SEA Study to update the status of existing SEA designated-sites and where appropriate to identify additional sites as deserving SEA status. These meetings will focus on identifying possible sites for further evaluation of biological significance and eligibility for SEA designation by the County's consultant team. Members of the public and government agencies are encouraged to attend and contribute their ideas and suggestions during the four SEA meetings being held in September and October. Your contribution is an important component to the success of the study.



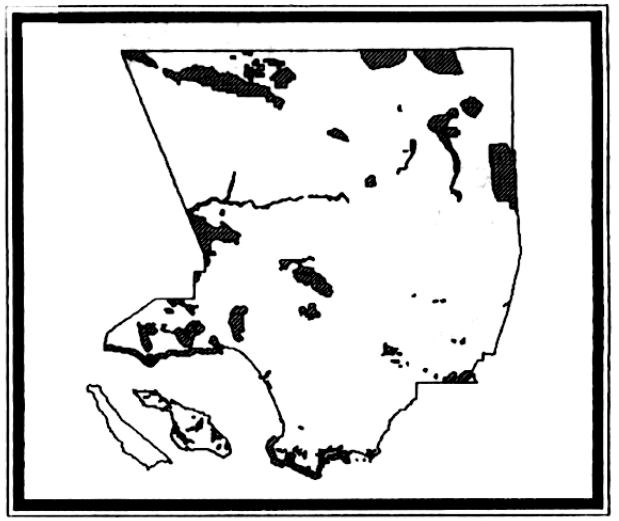
Criteria for SEA Designation

General Criteria for SEA designation include those areas that contain:

1. Biological resources, which are rare or unique to the area;
2. Habitat appropriate to endangered, threatened or otherwise protected species;
3. Undisturbed biological communities of plants or animal species;
4. A vital element necessary to another species' life-cycle, such as breeding, feeding or migratory locations, and are found in limited concentrations;
5. Species found in limited geographical areas, such as the Mojave Desert.
6. Habitat important to game species and fish communities; OR
7. Other special characteristics not mentioned above, but deserving of further study.

Special Accommodations

Individuals who require special accommodations or material in alternate format, please contact the ADA Coordinator, Mary Blair, at (213) 974-6488 (VOICE) or (213) 617-2292 (TDD), with at least 3 business days' notice prior to the scheduled workshop date.



Map of Existing SEAs

Response to Draft Elements

If you are unable to attend the workshops, you may obtain a copy of the draft materials handed out at the meetings by contacting staff at the below listed number. You may also view the drafts on the Department of Regional Planning's website located at www.planning.co.la.ca.us. We welcome your comments, which may be sent to the staff of the General Plan Development Section in any of the following forms:

Mail: Department of Regional Planning
General Plan Development Section
320 W. Temple Street
Los Angeles, CA 90012

Phone: (213) 974-6417

Fax: (213) 626-0434

Email: gmalone@planning.co.la.ca.us

For additional information, a copy of the draft documents, or to be placed on the General Plan mailing list, please contact the General Plan Staff by mail, phone, fax or email.

APPENDIX D

Public Meeting Materials

SIGNIFICANT ECOLOGICAL AREAS STUDY
1999-2000

Study Objectives

The Department of Regional Planning is undertaking a revision of the Los Angeles County General Plan. As part of this effort, the department is conducting a Significant Ecological Areas (SEAs) Study to update the status of existing SEA designated-sites and, where appropriate, to identify additional sites as deserving SEA status. The department has contracted with PCR, in association with Frank Hovore & Associates, and Forma (the PCR Project Team) to undertake such analysis, studies, field surveys, and research as is necessary to prepare a comprehensive reevaluation of Significant Ecological Areas (SEAs) within the unincorporated areas of Los Angeles County. This study will evaluate the continuing viability of existing designated SEAs, will update all pertinent information about the SEAs, and will recommend boundary adjustments as may be deemed necessary, considering changed circumstances due to public ownership changes, development activity, and environmental changes. The study shall also undertake a survey and analysis of selected areas for possible nomination for inclusion as SEAs in the General Plan.

The PCR Project Team will provide an overall product that assists the Department of Regional Planning in its land use regulatory role, specifically in the areas of natural/biological resource conservation and protection. This task will be accomplished through: the application of knowledge about individual SEAs gained through firsthand experience; the compilation of updated and reliable data; the formulation of clear policies for implementation; and, the development of baseline condition reports and a GIS-linked database. Ultimately, the study will be intended to be used as a tool to guide project applicants, Regional Planning staff, the SEA Technical Advisory Committee, and county decision-makers in sound stewardship of the biological resources within the county's SEAs.

A draft of the study will be released in the Spring of 2000, and the public will be given an opportunity to review and comment on this draft before a final version is completed. The study is expected to last one year from July 1999 to June 2000. Once completed, the Regional Planning staff will use the study to prepare amendments to the General Plan. Public hearings on these amendments will be heard before the Regional Planning Commission and the Board of Supervisors.

Geographic Coverage

Whereas the original SEA Study of 1976 nominated potential sites throughout the county, and included candidate areas that were completely within city jurisdictions, this study calls for a more circumscribed study area. The geographic focus of the study will be on areas wholly or partial within the unincorporated areas of the county. SEAs within the National Forest and public park lands will be studied only to the extent necessary to provide an

overview of the habitat area that is the subject of the SEA within privately-owned adjacent unincorporated areas.

The study will include the following existing SEAs as identified below: 19 sites that are wholly within the unincorporated area of the county, 22 sites that are partially within both a city and unincorporated area, multiple sites on Santa Catalina Island, Environmentally Sensitive Habitat Areas (ESHAs) associated with five SEAs and potential sites that may be nominated for SEA designation during the course of the study. Since SEAs vary considerably in size – from just a few acres to many square miles – the study will be further guided by the following criteria: first consideration will be given to those SEAs that are wholly within unincorporated areas; second consideration will be given to those SEAs that are predominately under private ownership as opposed to those that are predominately in open space or committed to a long term open space use; and thirdly, for those SEAs that are split between city and unincorporated areas, priority will be given to SEAs that are predominately within the unincorporated area. See accompanying maps for location of SEAs.

***SEAs Wholly within Unincorporated Jurisdiction*: (19 sites)**

Predominately in Private Ownership: (11 sites)

4. Upper La Sierra Canyon
7. Hepatic Gulch
48. Big Rock Wash
53. Lovejoy Butte
54. Piute Butte
55. Desert Montane Transect
58. Portal Ridge/Liebre Mountain
59. Tehachapi Foothills
60. Joshua Tree Woodland Habitat
61. Kentucky Springs*
63. Lyon Canyon

Predominately committed to Open Space or Public Ownership: (8 sites)

8. Malibu Creek State Park Buffer Area
9. Cold Creek*
43. Rio Hondo College Wildlife Sanctuary
47. Edwards Air Force Base
50. Rosamond Lake
51. Saddleback Butte State Park
57. Fairmont and Antelope Buttes
64. Valley Oaks Savannah, Newhall

SEAs Partially within a City and County Jurisdiction: (30 sites)

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* SEAs marked with an * were included in the 1991 SEA Study (Phase 1) prepared by Michael Brandman Associates. These SEAs need only to be analyzed if changes such as new species, a need for a boundary change, or significant development, etc., have occurred. SEAs located completely within the boundaries of incorporated cities are not a part of this study.

Predominately in Unincorporated Area and in Private Ownership: (7 sites)

10. Tuna Canyon*
14. Simi Hills
15. Tonner Canyon/Chino Hills*
19. San Francisquito Canyon*
20. Santa Susana Mountains
21. Santa Susana Pass
44. Sycamore and Turnbull Canyon

Predominately in City Area and in Private Ownership: (11 sites)

6. Las Virgenes*
12. Palo Comado Canyon
16. Buzzard Peak/San Jose Hills
17. Powder Canyon/Puente Hills
23. Santa Clara River
25. San Dimas Canyon
31. Rolling Hills Canyons
45. Dudleya Densiflora Population, Azusa*
49. Little Rock Wash
52. Alpine Butte
56. Ritter Ridge

Predominately in Unincorporated Area and committed to Open Space or Public Ownership: (3 sites)

3. Zuma Canyon
5. Malibu Canyon and Lagoon
42. Whittier Narrows Dam Recreation Area
Santa Catalina Island (multiple areas)

Predominately in City Area and in Public Ownership: (1 site)

35. Harbor Lake Regional Park

Environmentally Sensitive Habitat Areas (ESHAs) associated with the following SEAs:

3. Zuma Canyon (Zuma Canyon ESHA)
99. Zuma Canyon Buffer (Newton Canyon and Ramirez Canyon ESHAs)
4. Upper La Sierra Canyon (Upper La Sierra Canyon ESHA)
5. Malibu Canyon and Lagoon (Malibu Creek and Dark Canyon ESHAs)
9. Cold Creek (Cold Creek ESHA)
10. Tuna Canyon (Tuna Canyon and Pena Canyon ESHAs)

Potential SEA Candidates

SEAs marked with an * were included in the 1991 SEA Study (Phase 1) prepared by Michael Brandman Associates. These SEAs need only to be analyzed if changes such as new species, a need for a boundary change, or significant development, etc., have occurred. SEAs located completely within the boundaries of incorporated cities are not a part of this study.

Leo Carrillo State Park (Santa Monica Mountains)
Cruzan Mesa (north of Santa Clarita)
Bee Canyon (Canyon Country)
Barrel Springs (Palmdale area)
Buffer Areas (primarily watershed areas in Santa Monica Mountains)
And other areas that may be nominated and agreed to during course of contract

Release Date: September 21, 1999

SIGNIFICANT ECOLOGICAL AREA
NOMINATING FORM
1999-2000



Prepared by the PCR Project Team

Please review the attached supporting materials before completing this form. Based on the 1999 update study criteria, nominate areas you or your group feel should be considered for the Significant Ecological Area designation in the Los Angeles County General Plan Update. Given the immensity of the reviewing task, we strongly suggest submitting a nomination form with as much detail as possible. This will allow for a more thorough review of each nomination area. Additional sheets may be attached if needed. Use a separate form for each nomination area.

1. Location: Briefly describe the general location of the nomination area.

2. Boundaries: Briefly describe the approximate boundaries of the candidate area and attach a United States Geological Service (USGS) quad map with the boundaries delineated.

3. Size: Estimate the approximate area of the nomination site.

4. Owner (if known):

5. Current land uses:

6. Resources: Describe the resources present in the nominating area which would warrant this area being designated as a significant ecological area. Indicate which criteria are met.

7. References: List any published or unpublished information sources for the areas as well as other persons knowledgeable about the area.

_____

_____

_____

_____

_____

Thank you for your input.

Return your nominating material to:

George Malone
SEA Study Project Manager
Department of Regional Planning
320 West Temple Street
Los Angeles CA 90012

Optional:
Should we need to contact you about your submittal, please provide us with your name and address.

Name _____
Address _____
_____
_____
Phone _____

Questions regarding this form, the SEA Study, or the Los Angeles County General Plan Update Program may be answered by the General Plan Development Section staff at (213) 974-6417.

George Malone, Project Manager

Release Date: September 21, 1999

Appendix E

City and County Questionnaire Form

DEPARTMENT OF REGIONAL PLANNING
SIGNIFICANT ECOLOGICAL AREAS
SURVEY QUESTIONNAIRE UPDATE

I. Do you have biotic resources in the city that are protected by your city's general plan or zoning ordinance?

☐ YES ☐ NO

If yes, what resources and how protected? _____

_____

_____

_____

_____

_____

_____

II. Do you provide special planning recognition to the biotic resources within the city that have been identified by the County as Significant Ecological Areas (SEAS)?

☐ YES ☐ NO

III. What General Plan category and definition do you have for significant biotic resources in the City for a County designated SEA?

General Plan Designation _____

Description _____

_____

_____

_____

_____

_____

_____

IV. What Zoning designation do you use for significant biotic resources of SEA areas?

Zoning Designation _____
Description _____

V. Have any development projects been approved within County-designated Significant Ecological Areas located in your city since 1980?

☐ YES ☐ NO

If yes, please provide information concerning the nature of the approve projects (i.e., location, acreage, type of approved development, etc.).

VI. Do you utilize any mechanism to regulate development within City or County-designated Significant Ecological Areas?

☐ YES ☐ NO

If yes, please explain. _____

VII. Do you maintain updated information on the boundaries or biotic resources within Significant Ecological Areas located within your jurisdiction?

☐ YES ☐ NO

If yes, please explain what information you have available and ifthe County Planning Department may have access to this information.

VIII. List any projects within SEAs currently pending?

IX. What type of conditions, restrictions or development constraints are applied to projects proposed within SEA areas?

X. Do you have any other land use designations within the city that are used to designate biologic or ecologic resource areas?

If yes, please explain. _____

XI. Do you have any type of development monitoring program within the city?

If yes, please explain. _____

Appendix F

Comprehensive Study Sources

APPENDIX F: COMPREHENSIVE STUDY SOURCES

Abrams, L. 1974. *Illustrated Flora of the Pacific States, Vol. II*. Stanford University Press, Palo Alto, California.

Abrams, L. 1976. *Illustrated Flora of the Pacific States, Vol. I.* Stanford University Press, Palo Alto, California.

Abrams, L. and R. S. Ferris. 1980. *Illustrated Flora of the Pacific States, Vol. III.* Stanford University Press, Palo Alto, California.

Abrams, L. and R. S. Ferris. 1980. *Illustrated Flora of the Pacific States, Vol. IV.* Stanford University Press, Palo Alto, California.

American Ornithologists' Union. 1989. "Thirty-seventh Supplement to the American Ornithologists' Union Checklist of North American Birds." *Auk* 106:532-538.

American Ornithologists' Union. 1993. "Thirty-ninth Supplement to the American Ornithologists' Union Checklist of North American Birds." *Auk* 110 (3):675-682.

American Ornithologists' Union. 1998. *The American Ornithologists' Union Checklist of North American Birds*. 7th Edition, American Ornithologists' Union, Washington, D.C.

American Water Resources Association. 2000. *AWRA Proceedings: International Conference on Riparian Ecology and Management in Multi-Land Use Watersheds.*

Aspen Environmental Group. 1995. *Draft EIS Pacific Pipeline Project: Biological Assessment, Vol. II.* Prepared for the California Public Utilities Commission.

Atlantis Scientific. 1990. *Biological Impact Report, Project No. 90088/PM - 21998/CUP,* Beverly Hills, California.

Atwood, J. L. 1980. "United States Distribution of the California Black-tailed Gnatcatcher." *Western Birds* 11(2):65-78.

Atwood, J. L. 1992. "A Maximum Estimate of the California Gnatcatcher's Population Size in the United States." *Western Birds* 23(1):1-9.

Atwood, J. L., and J. S. Bolsinger. 1992. "Elevational Distribution of California Gnatcatchers in the United States." *Journal of Field Ornithology* 63(2):159-168.

Bahrami, M. M., A. M. Dove, E. M. Neaves and B. A. Roberts. 1997. *Puente Hills Corridor: Greenspace Connectivity for Wildlife and People*, Department of Landscape Architecture, California State Polytechnic University, Pomona, California.

Barbour, M. G. and J. Major. 1977. *Terrestrial Vegetation of California*. John Wiley & Sons, New York, New York.

Barbour, M. G. and J. Major, eds. 1990. *Terrestrial Vegetation of California.* California Native Plant Society, Special Publication No. 9.

Baskin, J. N. and T. R. Haglund. 1995. *Distribution and Abundance of Native Fishes, Southwestern Pond Turtles and Two-Striped Garter Snakes Below Morris Dam and in Brown's Gulch, San Gabriel River Canyon.* San Marino Environmental Associates, San Marino, California.

Beier, P. and R. H. Barrett. 1991. *Quarterly Report: Orange County Cooperative Mountain Lion Study*. Department of Forestry and Resource Management, University of California, Berkeley, California.

Bennett, A. F. 1990. Habitat corridors and the conservation of small mammals in a fragmented forest. *Landscape Ecology* 4:109-122.

Biological Assessment Services. 1992. *Biological Resources Assessment Vesting Tentative Tract No. 47927, SEA No. 12, Palo Comado Canyon,* Los Angeles County, California.

Bowland, J. L. 1989. *Biota Report, PM 20108; PM 20148, Project Nos. 88371 and 88416, SEA No. 23,* Acton, California.

Boyd, S. 1999. "Vascular flora of the Liebre Mountains, Western Transverse Ranges, California." Publ. No. 5, Rancho Santa Ana Botanic Garden, Claremont, California, in *Aliso,* 18(2):93-139.

Brockman, C. F. 1968. *A Guide to Field Identification: Trees of North America.* Western Publishing, New York, New York.

Brown, J. H., Kodiac-Brown, A. 1977. "Turnover rates in insular island biogeography: Effects of immigration and extinction." *Ecology* 58(2):445-449.

Burbrink, F. T., C. A. Phillips, and E. J. Heske. 1998. "A riparian zone in southern Illinois as a potential dispersal corridor for reptiles and amphibians." *Biological Conservation* 86:107-115.

Burt, W. H. and R. P. Grossenheider. 1976. *A Field Guide to the Mammals.* 3rd ed. Houghton-Mifflin, Boston, Massachusetts.

C. W. Cook Co. Inc. 1990. *SEATAC Information Packet for SEA No. 4, Project No. 86089 (Biology Reports),* Los Angeles, California.

California Coastal Zone Conservation Commission. 1975. California Conservation Plan.

California Native Plant Society. 1976. *Symposium Proceedings: Plant Communities of Southern California.*

California Native Plant Society. 1994. *Inventory of Rare and Endangered Vascular Plants of California.*

Caughley, G. and A. Gunn. 1996. *Conservation Biology In Theory and Practice*. Ann Arbor, Michigan.

Chambers Group. 1994. *EIR: Soledad Canyon Sand and Gravel Mining.* Los Angeles County, California.

Coatsworth, S. 1989, resubmitted 1990. *Biota Report for Tentative Parcel Map 20461, SEA No. 61,* Los Angeles County, California.

Coatsworth, S. 1989, resubmitted 1990. *Biota Report for Tentative Parcel Map 20726, SEA No. 61,* Los Angeles County, California.

Coatsworth, S. 1990. *Biota Report for Tentative Parcel Map 21462, SEA No. 61,* Los Angeles County, California.

Coatsworth, S. and T. Laughlin. 1989. *Biota Report for Tentative Tract No. 48238, SEA No. 5,* Los Angeles County, California.

County of Los Angeles, Department of Regional Planning. 1993. *Additional Information and Analysis Regarding the Environmental Impact Report for the Sunshine Canyon Landfill Extension*, Los Angeles County, California.

County of Los Angeles, Department of Regional Planning. 1996. *Environmental Impact Report Vol. 1 (Screencheck Draft), Project No. 89-251, SEA No. 12*, Los Angeles County, California.

County of Los Angeles, Department of Regional Planning. 1999. *The Santa Monica Mountains North Area Plan (Draft),* Los Angeles County, California.

Crampton, B. 1974. *Grasses in California.* Berkeley, California.

Dale, N. 1986. *Flowering Plants of the Santa Monica Mountains, Coastal and Chaparral Regions of Southern California.* Capra Press, Santa Barbara.

Dames, Moore & Sikand Engineering Associates. 1991. *Addendum to the SEATAC Report for a Portion of SEA No. 19, Tentative Map 44831, C.U.P. 86-491*, Los Angeles County, California.

David Carroll & Associates. 1991. *Biota Report for Subdivision Parcel Map No. 89494 Latigo Canyon*, Los Angeles County, California.

David Carroll & Associates. 1992. *Biological Constraints Analysis Report, Project No. 91-359, SEA No. 3 Buffer, Latigo Canyon Road*, Los Angeles County, California.

David Carroll & Associates. 1994. *Biological Constraints Analysis Report with Impacts and Mitigation; Project: Campus by the Sea Santa Catalina Island*. Topanga, California.

David J. Tanner & Associates. 1988. *Biological Resources Assessment and Tree Inventory and Evaluation for Malibu Terrace, Tract No. 45342 and No. 45343, SEA No. 12*, Los Angeles County, California.

Demers, M. N., J. W. Simpson, R. E. J. Boerner, A. Silva, L. Berns, and F. Artigas. 1995. Fencerows, edges, and implications of changing connectivity illustrated by two contiguous Ohio landscapes. *Conservation Biology* 9:1159-1168.

Diamond, J. M. and H. L. Jones, 1980. Breeding Land Birds of the Channel Islands. In *The California Islands: Proceedings of a Multidisciplinary Symposium,* ed. D. M. Power, pp. 597-612. Santa Barbara Museum of Natural History, Santa Barbara, California.

Dunkle, M., 1950. Plant Ecology of the Channel Islands of California. *Allan Hancock Foundation Publications. Pacific Expeditions* 13:247-386.

Edelman, P. 1990. "Critical Wildlife Corridor/Habitat Linkage Areas Between the Santa Susana Mountains, the Simi Hills, and the Santa Monica Mountains." Prepared for *The Nature Conservancy.* Los Angeles, California.

Edelman, P. 1990 (revised 1991). *Critical Wildlife Corridor/Habitat Linkage Areas Between the Santa Susana Mountains, The Simi Hills and The Santa Monica Mountains,* Los Angeles County, California.

Ehrlich, P. R. 1988. *The Birder's Handbook: A Field Guide to the Natural History of North American Birds*. New York, New York.

EIP Associates. 1990. *Biota Report, SEATAC Project No. 88537, The Hughes Ranch, Quartz Hill,* Los Angeles County, California.

England & Nelson Environmental Consultants. 1976. *Land Capability/Suitability Study, Los Angeles County General Plan Revision Program, Significant Ecological Areas Report,* Riverside, California.

Entrix, INC. 1991. *Biological Constraints Analysis Report - Mills Landing Well Project Catalina Island*. Sacramento, California.

Envicom Corporation. 1989. *Biota Report (resubmittal) for Conditional Use Permit Case No. 87361, SEA No. 5, November 1989.* Los Angeles County, California.

Envicom Corporation. 1989. *Oak Tree Report for Lots 159 and 160 of Tentative Tract No. 32268 for Bulk Grading Disposal for Adjacent Tract No. 37824,* Calabasas, California.

Envicom Corporation. 1989. *Biota Report, SEA No. 3 Buffer, Mulholland Highway Residential Development (4th Submittal),* Los Angeles County, California.

Envicom Corporation. 1989. *Biota Report for Conditional Use Permit Case No. 87361, SEA No. 5, September 1989*. Los Angeles County, California.

Envicom Corporation. 1990. *Biota Report for Lots 159 and 160 of Tentative Tract No. 32268,* Calabasas, California.

Envicom Corporation. 1990. *Biota Report for Old West Valley Driving Range, June 1990*. Calabasas, California.

Envicom Corporation. 1990. *Biota Report for Old West Valley Driving Range (2nd Submittal), September 1990.* Calabasas, California.

Envicom Corporation. 1992. *Soka University Proposed Expansion Project,* Los Angeles County, California.

Envicom Corporation. 1992 (revised 1993). *A Consideration of Wildlife Movements in the Santa Susana Mountains*, Los Angeles County, California.

Envicom Corporation. 1992. *Biological Constraints Analysis, Tentative Parcel Map 22352, SEA No. 3,* Los Angeles County, California.

Envicom Corporation. 1999. *Biota Report (Resubmittal No. 2), Beautiful Homes Site,* Los Angeles County, California.

Environmental Audit, Inc. 1989. *Biota Report for Barrel Springs Ranch 63 Acre Tract,* Palmdale, California.

Environmental Audit, Inc. 1990. *Biota Report for Raphael 9.3 Acre Parcel (Tentative Parcel Map No. 20549) at 31905 Pacific Coast Highway,* Malibu, California.

Environmental Audit, Inc. 1990. *Biota Report for Pepperdine University LRDP Developments, Including CUP Application No. 90-218,* Malibu, California.

ESA (Environmental Science Associates). 1999. *Biological Constraints of Los Angeles Prayer Mountain, SEATAC Analysis Report,* Los Angeles County, California.

Fishman, R. H., Charlton, D., and M. Hagan. 1989, revised. *Biota Survey and Impact Assessment for Parcel Map No. 19258, Angeles Forest Highway,* Los Angeles County, California.

Fishman, R. H., Charlton, D., and R. Stafford. 1990, revised. *Biota Survey and Impact Assessment for Parcel Map No. 20348, Angeles Forest Highway,* Los Angeles County, California.

Forman, R. T. T. 1991. Landscape corridors: from theoretical foundations to public policy. Pages 71-84 in D. A. Saunders and R. J. Hobbs, eds. *Nature Conservation 2: The Role of Corridors*. Surrey Beatty & Sons PTY Limited, Chipping Norton.

Frank Hovore & Associates. 1989. *SEATAC Biotic Report, SEA No. 23 the Santa Clara River Buffer Zone, Tentative Tract 21273, Project No. 89315,* Santa Clarita, California.

Frank Hovore & Associates. 1990. *SEATAC Biota Report, Supplemental Materials to Tierra Madre Consultants (TMC) Report on Tentative Parcel Maps 19628, 19899, 20056, 20057, San Francisquito Canyon, SEA No. 19.*

Frank Hovore & Associates. 1990. *SEATAC Biota Report, SEA No. 61, Kentucky Springs, Tentative Parcel Map No. 22107,* Acton, California.

Frank Hovore & Associates. 1996. *Biotic Assessment and Report of Sensitive Resource Surveys, L.A. Dept. of Water and Power, Castaic Power Plant and Vicinity,* Los Angeles County, California.

Frank Hovore & Associates. 1997. *Biological Constraints Assessment, Oak Springs Golf Course,* TT 52004.

Frank Hovore & Associates. 1998. *Biological Resources Report, Golden Valley Ranch*.

Frank Hovore & Associates. 1999. *Golden Valley Ranch Biological Resources Report*.

Frank Hovore & Associates. 1999. *Biological Resources Report, Placerita Chaparral / Mitchell Development*.

Furgo-McClelland (West), Inc. 1992. *Biota Report for the Proposed Agua Dulce Quarry (Project No. 91307).*

Fugro West INC. 1994. *Biological Constraints/Impact Analysis for the Catalina Island Marine Institute Master Renovation Plan,* Ventura, California.

Fugro West INC. 1995. *Biological Constraints/Impact Analysis for the Eagles Nest Road Re-alignment Project*, Ventura, California.

Garcelon, D. K.. 1991. *Biota Report for SEATAC on the Wrigley Memorial Botanic Garden Building Site*. Institute for Wildlife Studies, Arcata, California.

Garrett, K. and J. Dunn. 1981. *Birds of Southern California: Status and Distribution.* Los Angeles Audubon Society, Los Angeles, California.

Garth, J. and J. Tilden. 1986. *California Butterflies.* University of California Press, Berkeley, California.

Goode, S. 1989. *Revised Impacts and Mitigations, SEATAC Biota Report on Nos. 88502, 47811 Three Points Road,* Los Angeles County, California.

Goode, S. 1989. *Revised SEATAC Biota Report on Nos. 88502, 47811 Three Points Road,* Los Angeles County, California.

Goode, S. 1989. *SEATAC Biota Report on Nos. 88502, 47811 Three Points Road,* Los Angeles County, California.

Guthrie, D. 1988. *Bird Surveys Along the Santa Clara River and its Tributaries Near Valencia, California.*

Guthrie, D. 1990. *Bird Surveys Along the Santa Clara River and its Tributaries Near Valencia, California.*

Guthrie, D. 1993. *Bird Surveys Along the Santa Clara River and its Tributaries Near Valencia, California.*

Guthrie, D. 1995. *Bird Surveys Along the Santa Clara River and its Tributaries Near Valencia, California.*

Guthrie, D. A. and B. A. Prigge. 1988. *Biological Survey of Case 88312, Proposed Christara Motion Picture Studio Site, 23747, The Old Road, Unincorporated Area of Newhall*, Los Angeles County, California.

Guthrie, D. A. and B. A. Prigge. 1989, revised 1990. *Emendations I & II of Biological Survey of Case 88551, Proposed Housing Development for Tract No. 47329, Unincorporated Area of Chatsworth*, Los Angeles County, California.

Guthrie, D. A. and B. A. Prigge. 1989, revised 1991. *Biological Survey of Case 88551, Proposed Housing Development for Tract No. 47329, Unincorporated Area of Chatsworth*, Los Angeles County, California.

Haas, C. and K. Crooks. 1999. *Carnivore Abundance and Distribution Throughout the Puente/ Chino Hills*, The Mountains and Recreation Conservation Authority, Malibu, California.

Hall, E. 1981. *The Mammals of North America.* Wiley, New York, New York.

Harris, L. D., T. Hoctor, D. Maehr, and J. Sanderson. 1996. The role of networks and corridors in enhancing the value and protection of parks and equivalent area. Pages 173-197 in R. G. Wright, ed. *National parks and protected areas: Their role in environmental protection*. Blackwell Scientific Publications, Cambridge, Massachusetts, USA; Oxford, England, UK.

Harris, L. D. 1988. Special Visual Presentation. Landscape Linkages: The Dispersal Corridor Approach to Wildlife Conservation. Pages 595-607. *Trans. 53rd N.A. Wildl. & Nat. Res. Conf.*

Harris, L. D., and J. Scheck. 1991. From implications to applications: the dispersal corridor principle applied to the conservation of biological diversity. Pages 189-220 in D. A. Saunders and R. J. Hobbs, eds. *Nature Conservation 2: The Role of Corridors*. Surrey Beatty & Sons Pty Limited, Chipping Norton.

Harrison, R. L. 1992. Toward A theory of Inter-Refuge Corridor Design. *Conservation Biology* 6:293-295.

Harrison, S. 1994. Metapopulations and conservation. Pages 111-128 in P. J. Edward, R. M. May, and N. R. Webb, eds. *Large-scale Ecology and Conservation Biology*. Blackwell Scientific Press, Oxford.

Hartzell, A. K. and H. Hewitt. 1992. Fish and Game's Control Over Land Use. *California Planner* 4(8):1-9.

Henein, K., and G. Merriam. 1990. The elements of connectivity where corridor quality is variable. *Landscape Ecology* 4:157-170.

Henrickson, J., PhD. 1996. *Biological Constraints Analysis Zone Change – Conditional Use Permit 96-113, 22925 Coltrane Avenue, Within SEA No. 20, Santa Susana Mountains,* Los Angeles County, California.

Henrickson, J., PhD., Independent Environmental Consultants. October 16, 1992. *Biological Constraints Analysis of Tentative Minor Land Division Map No. 23217, in Buffer Zone of SEA No. 23, Soledad Canyon, Santa Clara River,* Los Angeles County, California.

Hickman, J. C. 1993. *The Jepson Manual: Higher Plants of California.* University of California Press, Berkeley, California.

Hogue, Charles L. 1992. *Insects of the Los Angeles Basin.* Natural History Museum of Los Angeles. Los Angeles, California.

Holland, R. F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. State of California Resources Agency. Department of Fish and Game. Non-Game Heritage Program. Sacramento, California.

Houghton, W. B. 1986. *Biota Report on Parcel Map 17684, SEA No. 19,* Los Angeles County, California.

Hovore, F. T. 2000. *Checklist of the birds of Robinson Ranch golf course development*.

Hudson, W. E. 1991. *Landscape Linkages and Biodiversity*. Washington, D.C., Island Press.

Impact Sciences, Inc. 1988. *Biota Report for Calabasas Park West Project, SEA No. 12,* Los Angeles County, California.

Impact Sciences, Inc. 1988. *Biota Report for Calabasas Road Expansion, SEA No. 12, (Amended June 1988),* Los Angeles County, California.

Impact Sciences, Inc. and RECON. 1994. *Biological Constraints Analysis: Newhall Ranch, California, Case No. 94087.*

Impact Sciences, Inc. and RECON. 1995. *Biota Report, Newhall Ranch Specific Plan, Tentative Tract Map 44831,* Santa Clara River Valley, California.

Impact Sciences, Inc. 1995a. *Biological Constraints Analysis: Ranch Road South Project, Valencia, California, Tentative Tract Map 51931.*

Impact Sciences, Inc. 1995b. *Biota Report: West Creek Project.*

Impact Sciences, Inc. 1995c. *Biota Report: West Creek Project. Supplemental Information Submitted to SEATAC at Their Request on December 16, 1995.* Prepared for Los Angeles County Department of Regional Planning, Los Angeles, California.

Impact Sciences, Inc. 1995. *Biota Report for Creekside Village Project, Tentative Tract Map 44831,* Los Angeles County, California.

Impact Sciences, Inc. 1995. *Biological Constraints Analysis, Tentative Parcel Map 19091 (West San Francisquito Creek),* Los Angeles County, California.

Impact Sciences, Inc. 1996 (Supplemental Info. Submitted Nov. 2, 1999). *Biota Report, Dahl Property, SEA No. 21, Tentative Parcel Map 23793,* Chatsworth, California.

Independent Environmental Consultants and Sikand Engineering Associates. 1988, revised 1989. *SEATAC Report for a Portion of SEA No. 23,* Arbor Park, California.

Independent Environmental Consultants. 1990. *SEATAC Report for a Portion of SEA No. 19. Tentative Tract Map 44831. June 21.* Prepared for Valencia Company.

Independent Environmental Consultants. 1992. *SEATAC Report for Tentative Minor Land Division Map. No. 91253,* Los Angeles, California.

Independent Environmental Consultants. 1992. *Biological Constraints Analysis of Tentative Minor Land Division Map No. 23217, in Buffer Zone of SEA No. 23 Soledad Canyon, Santa Clara River,* Los Angeles County, California.

Independent Environmental Consultants. 1994. *Biological Constraints Analysis, the Amargosa Creek Improvement Project, Identification and Analysis of Impacts to SEA No. 56,* Los Angeles County, California.

Independent Environmental Consultants. 1993. *SEATAC Report for Tentative Minor Land Division Map No. 22648, Case No. 91253, SEA No. 3 Buffer, 32356 Mulholland Highway, in Unincorporated Territory of the Santa Monica Mountains,* Los Angeles County, California.

Institute of Ecology. 1977. *Riparian Forests in California: Their Ecology and Conservation*.

Jackson, T. C. et al., *Developer's Guide to Endangered Species Regulation*. Home Builder Press, Washington, D.C.

Jaeger, E. C. 1941. *Desert Wild Flowers.* Stanford, California.

Jameson, Jr., E. W. and H. J. Peeters. 1988. *California Mammals.* University of California Press, Berkeley, California.

Jennings, M. R. and M. P. Hayes. *An Annotated Checklist of the Amphibians and Reptile Species of Special Concern in California*. State of California Resources Agency. Department of Fish and Game. Sacramento, California.

John M. Tettemer & Associates, Ltd. 1993, addendum submitted 1993. *U.S. Army Corps of Engineers, General Section 404 Permit, Santa Clara River from Castaic Creek to One-Half Mile Above the Los Angeles Aqueduct and Portions of San Francisquito Creek and the Santa Clara River, South Fork,* Los Angeles County, California.

John M. Tettemer & Associates, Ltd. 1994. *Response to U.S. Army Corps of Engineers Scoping Notice Comments for the U.S. Army Corps of Engineers, General Section 404 Permit, Santa Clara River from Castaic Creek to One-Half Mile Above the Los Angeles Aqueduct and Portions of San Francisquito Creek and the Santa Clara River, South Fork,* Los Angeles County, California.

John M. Tettemer & Associates, Ltd. 1993. *Biological Assessment: General Permit for the Santa Clara River from Castaic Creek to One-Half Mile Above the Los Angeles Aqueduct, Portions of San Francisquito Creek, and the Santa Clara River, South Fork,* Los Angeles County, California.

Jones, C., R. S. Hoffmann, D. W. Rice, R. J. Baker, M. D. Engstrom, R. D. Bradley, D. J. Schmidly, and C. A. Jones. 1997. *Revised Checklist of North American Mammals North of Mexico.* Occasional Papers, Museum of Texas Tech University, Lubbock, Texas.

Land and Water Company, The. 1992. *Biological Constraints Analysis Supplemental Report, Potential Impacts of Development and Proposed Mitigation, Project No. 91-359,* Los Angeles County, California.

Lee Newman & Associates, Inc. 1988. *Tree Report: The Salvation Army Camp (Mt. Crags Camp and Camp Gilmore),* Los Angeles County, California.

Lee Newman Design Group, Inc. 1995. *Oak Tree Report, Vesting Tentative Tract No. 47927, SEA No. 12,* Los Angeles County, California.

Lieberstein, T. A. 1989. *Reserve Design in the Santa Monica Mountains.* Thesis for M.A. degree, Cal State University Northridge.

Los Angeles County Department of Regional Planning. 1983. *Santa Catalina Island - Local Coastal Plan (LCP).* Los Angeles, California.

Los Angeles County Museum of National History. 1991. *Los Angeles County Breeding Bird Atlas, Santa Clarita Valley blocks*. California.

MacArthur, R. H., and E. O. Wilson. 1967. *The Theory of Island Biogeography*. Princeton University Press, Princeton.

Machtans, C. S., M. Villard, S. J. Hannon. 1996. "Use of Riparian Buffer Strips as Movement Corridors by forest Birds." *Conservation Biology* 10(5):1366-1379.

Mane'e Planning, Economic and Environmental Services. 1989. *Ecological Impact Evaluation for Surface Mining Permit 86-357, Curtis Sand and Gravel (revised),* Yucaipa, California.

Marsh, K.G. 1990. *Biota Report, Los Angeles County Project No. 89189, for Proposed Surface Mining Within SEA No. 23 (Santa Clara River),* Los Angeles County, California.

Mattoni, R. 1990. *Butterflies of greater Los Angeles.* Center for the Conservation of Biodiversity/Lepidoptera Research Foundation, Inc. California.

McAuley, M. 1996 (2nd ed.). *Wildflowers of the Santa Monica Mountains*. Canyon Publishing: Canoga Park, California.

McClelland Consultants (West), Inc. 1991. *Biota Report for Tentative Tract Map No. 21221 (3rd submittal),* Los Angeles County, California.

Michael Brandman & Associates. 1988. *Biological Resources Assessment, Woolsey Canyon Project Site, Tentative Tract 45756,* Los Angeles County, California.

Michael Brandman & Associates. 1989. *Biological Resources Assessment for Malibu Terrace Project Site, Project No. 87527, SEA No. 12,* Los Angeles County, California.

Michael Brandman & Associates. 1989. *Biological Resources Assessment for the Proposed Seminole Water Tank No. 2, Los Virgenes Municipal Water District, SEA No.3 Buffer,* Los Angeles County, California.

Michael Brandman & Associates. 1989. *Supplement to Biological Resources Assessment, Brea Canyon Tentative Tract No. 44478,* Los Angeles County, California.

Michael Brandman & Associates. 1989. *Supplemental to Biological Resources Assessment of Indian Wells Estates, Tentative Tract 44327,* Los Angeles County, California.

Michael Brandman & Associates. 1989. *Supplement to Biological Resources Assessment, Brea Canyon Tentative Tract No. 44478,* Los Angeles County, California.

Michael Brandman & Associates. 1989. *Biological Resources Assessment, A and S Development Site,* Los Angeles, California.

Michael Brandman & Associates. 1989. *Biological Resources Assessment, Brea Canyon Tentative Tract No. 44478,* Los Angeles County, California.

Michael Brandman & Associates. 1990. *Biological Resources Assessment for the Proposed Cordillera Reclaimed Water Tank and Ancillary Facilities, Las Virgenes Municipal Water District, SEA No. 12,* Los Angeles County, California.

Michael Brandman & Associates. 1991. *Phase I Study for the Kentucky Springs SEA No. 61,* Los Angeles County, California.

Michael Brandman & Associates. 1991. *Phase I Study for the Tuna Canyon SEA No. 10*, Los Angeles County, California.

Michael Brandman & Associates. 1991. *Biological Resources Assessment for the Proposed Liberty Canyon Project, Project No. 90152, SEA No. 12,* Los Angeles County, California.

Michael Brandman & Associates. 1991. *Biological Constraints Analysis for the Proposed Apple Creek Estates Project,* Los Angeles County, California.

Michael Brandman & Associates. 1991. *Phase I Study for the Tonner Canyon/Chino Hills SEA No. 15.* Los Angeles County, California.

Michael Brandman & Associates. 1991. *Phase I Report: San Francisquito Canyon SEA No. 19,* Los Angeles County, California.

Michael Brandman & Associates. 1991. *Phase I Study for the Las Virgenes SEA No. 6,* Los Angeles County, California.

Michael Brandman & Associates. 1991. *Phase I Study for the Cold Creek SEA No. 9,* Los Angeles County, California.

Michael Brandman & Associates. 1991. *Biological Resources Assessment for the Proposed Liberty Canyon Project (Resubmittal), Project No. 90152, SEA No. 12,* Los Angeles County, California.

Michael Brandman & Associates. 1992. *Supplemental Biota Report for the Proposed Vista de Lomas Hacienda Heights Project Powder Canyon SEA No. 17, Tentative Tract 51153,* Los Angeles County, California.

Michael Brandman & Associates. 1992. *Biological Constraints for Proposed Clougherty Ranch Project.*

Michael Brandman & Associates. 1992. *Biota Report for the Proposed Vista de Lomas Hacienda Heights Projects, Tentative Tract 51153,* Los Angeles County, California.

Michael Brandman & Associates. 1992. *Biological Constraints Analysis for the Catalina Island Nature Interpretive Center Santa Catalina Island, California.* Los Angeles, California.

Michael Brandman & Associates. 1993 (revisions and supplemental info.). *Biota Report for the Proposed Tesoro del Valle Project.*

Michael Brandman & Associates. 1993. *Responses to SEATAC Comments and Recommendations on Vista de Lomas Project, Powder Canyon SEA No. 17,* Los Angeles, California.

Michael Brandman & Associates, et al. 1994. *An Approach to Reconciling Wildlife and Economic Development Issues for Land Assets in the Puente Hills.*

Michael Brandman & Associates. 1995. *Biological Constraints Analysis for Tentative Parcel Map No. 23793,* Los Angeles County, California.

Michael Brandman & Associates. 1996. *Draft Natural Environment Study for Foothill Transportation Corridor - South,* Los Angeles County, California.

Michael L. Ahlering & Associates, Inc. 1988. *Biota Supplement, Tentative Tract No. 46485,* Diamond Bar, California.

Millspaugh, C.F. and L.W. Nuttall, 1923. "Flora of Santa Catalina Island (CA)." *Publications of the Field Museum of Natural History, Botanical Series* 212, 5:1-413, 13 pl.

Muns, B., 1984. *Santa Catalina Island Flora Check List.* Bob Muns, Arcadia, California.

Munz, P. A. 1974. *A Flora of Southern California.* University of California Press, Berkeley, California.

Munz, P. A. and D. D. Keck. 1959. *A California Flora.* University of California Press, Berkeley, California.

Munz, P. A. 1962. *California Desert Wildflowers*. Berkeley, California.

Naeem, S., L. J. Thompson, S. P. Laler, J. H. Lawton, and R. M. Woodfin. 1994. Declining biodiversity can alter the performance of ecosystems. *Nature* 368:734-737.

Naiman, R. J., H. Decamps, and M. Pollock. 1993. The Role of Riparian Corridors in Maintaining Regional Biodiversity. *Ecological Applications* 3:209-212.

Ndubisi, F., T. Demeo, and N. D. Ditto. 1995. Environmentally sensitive areas: a template for developing greenway corridors. *Landscape and Urban Planning* 33:159-177.

Nelson, E. 2000. "Cameras Capture Critter Commuters", *Daily News,* Monday May 22, 2000.

Niehaus, T. F. and C. L. Ripper. 1976. *A Field Guide to Pacific States Wildflowers.* Houghton-Mifflin Company, Boston, Massachusetts.

Noss, R. F. 1991. *Landscape linkages and biodiversity*. W. E. Hudson. Washington, D.C.: 27-39.

Noss, R. 1991. Landscape connectivity: different functions at different scales. Pages 27-39 in W. E. Hudson, ed. *Landscape Linkages and Biodiversity*. Island Press, Washington, D.C.

Opdam, P., R. Foppen, R. Reijnen, and A. Schotman. 1995. The landscape ecological approach in bird conservation: Integrating the metapopulation concept into spatial planning. *Ibis* 137:S139-S146.

P&D Environmental Services. 1995. *Biological Resources Assessment Vesting Tentative Tract No. 47927, SEA No. 12, Palo Comado Canyon,* Los Angeles County, California.

P&D Environmental Services. 1995. *Biological Resources Assessment for Tentative Tract No. 47927, SEA No. 12, Palo Comado Canyon,* Los Angeles County, California.

Parsons Engineering Science, INC. 1995. *Biological Constraints Analysis with potential Project Impacts and Mitigation Measures for Camp Cherry Valley Facility Improvement Plan San Gabriel Valley Council Boy Scouts of America Santa Catalina Island, California*. Pasadena, California.

Parsons Engineering Science, INC. 1995. *Biological Constraints Analysis - Camp Cherry Valley Council, BSA Santa Catalina Island*. Pasadena, California.

Parsons Engineering Science, INC. 1995. *Biological Constraints Analysis - Camp Cherry Valley, Catalina Island; Presentation to County of Los Angeles Department of Regional Planning - SEATAC.* Pasadena, California.

Pequegnat, W. E. 1951. "The Biota of the Santa Ana Mountains," Reprinted from the *Journal of Entomology and Zoology* vol. 42, nos. 3 and 4.

Peterson, R. T. 1990. *Peterson Field Guides: Western Birds*. New York, New York.

Planning Center, The. 1989. *Biological Resources Assessment, Southern California Golf Association Member's Club at Firestone, Tentative Tract No. 48380, SEA No. 15 Tonner Canyon,* Los Angeles, California.

Planning Center, The. 1990. *Biological Resources Assessment, Southern California Golf Association Member's Club at Firestone, Tentative Tract No. 48380, SEA No. 15 Tonner Canyon,* Los Angeles, California.

Planning Center, The. 1990. *Biological Resources Assessment for Tentative Tract No. 47927, SEA No. 12 Palo Comado Canyon,* Los Angeles County, California.

Planning Center, The. 1991. *Biological Resources Assessment for Tentative Tract No. 21887, SEA No. 3,* Los Angeles County, California.

Planning Consultants Research. 1995. *Biological Assessment for the Big Dalton Dam Modification Project,* Santa Monica, California.

Primack, R. B. 1993. *Essentials of Conservation Biology*. Sunderland, Massachusetts.

Quinn, R. D. 1990. *Biota Report, Tract No. 48632, SEA 44, Hacienda Heights, California. Los Angeles County, California.* Department of Biological Sciences, Cal State Polytechnic University, Pomona, California.

Quinn, R. D. 1990. *Addendum to Supplement Biota Report, Tract No. 48632, SEA 44, Hacienda Heights, California. Los Angeles, California.* Department of Biological Sciences, Cal State Polytechnic University, Pomona, California.

Quinn, R. D. 1990. *Supplement to Biota Report, Tract No. 48632, SEA 44, Hacienda Heights, California. Los Angeles County, California.* Department of Biological Sciences, Cal State Polytechnic University, Pomona, California.

Quinn, R. D. 1998. *Status of Black Walnuts (Juglans californica) in Southern Puente Hills Site*, Department of Biological Sciences, California State Polytechnic University, Pomona, California.

Quinn, R. D. Date unknown. *The Status of Walnut Forests and Woodlands (Juglans californica) in Southern California*, Department of Biological Sciences, California State Polytechnic University, Pomona, California.

Rachel Tierney Consulting. 1996. *Supplemental Biota Report. Soledad Rock Quarry.*

Ramussen, A. M. 1990. *Condition and Present Status of Los Angeles County Significant Ecological Areas: A Report to the Mountains Recreation and Conservation Authority*. Los Angeles County, California.

Raven, P. H., H. J. Thompson, and B. A., Prigge. 1986. *Flora of the Santa Monica Mountains*. 2nd ed. University of California Press, Los Angeles, California.

Reed, P. B. Jr. 1988. *National List of Plant Species that Occur in Wetlands: California (Region 0)*. U.S. Fish and Wildlife Service Biological Report 88(26.10). U.S. Department of the Interior. Washington, D.C.

Regional Environmental Consultants (RECON) and Impact Sciences. 1995. *Biota Report, Newhall Ranch Specific Plan, Volume I of II, Santa Clara River Valley*, California, Tentative Tract Map 44831.

Regional Environmental Consultants (RECON) and Impact Sciences. 1995. *Biota Report, Newhall Ranch Specific Plan, Volume II of II, Santa Clara River Valley*, California, Tentative Tract Map 44831.

Rindlaub, K. 1989. *Biological Resources Evaluation, Julian Property, Loma Metisse and Rotunde Mesa Road, Santa Monica Mountains, SEA No. 5*, Los Angeles County, California.

Robbins, C. S., B. Brunn, and H. Zim. 1960. *A Guide to Field Identification. Birds of Northern America*. Western Publishing, New York, New York.

Robbins, W. W., M. K. Bellue, and W. S. Ball. 1951. *Weeds of California*. State of California Department of Agriculture. Sacramento, California.

Rosenberg, D. K., B. R. Noon, and E. C. Meslow. 1997. "Biological corridors: form, function, and efficacy." *Bioscience* November: 677.

Santa Catalina Island Company. 1989. Santa Catalina Island: *Land Ownership Map*. Avalon, California.

Sawyer, J. O. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation.* California Native Plant Society, Sacramento, California.

Scheidt, V. N., M.A. Biological Consultant. 1991. *Biota Report for the Vierich Lot-Split Project, Parcel Map No. 21737; File No. 90259,* Los Angeles County, California.

Schoenherr, A.A. 1989. *Endangered Plant Communities of Southern California. Proceedings of the 15th Annual Symposium, Southern California Botanists*. Southern California Botanists Special Publication No. 3. Claremont, California.

Schultz, C. B. 1995. Corridors, islands and stepping stones: the role of dispersal behavior in designing reserves for a rare Oregon Butterfly. *Bulletin of Ecological Society of America* 76:240.

Scott, T. A. and D. S. Cooper. 1999. *Summary of Avian Resources of the Puente-Chino Hills Corridor, Los Angeles, Orange, San Bernardino, and Riverside counties, California*. Department of Earth Sciences. University of California, Riverside, California.

SEATAC Biota Report. 1998. *North Valencia Annexation 2 Project (VTTM's 44831, 52667) San Francisquito Canyon.* Santa Clarita, Los Angeles County, California.

SEATAC Biota Report. 1998. *West Creek (VTTM 52455) and East Creek (VTTMs 44831, 52667) San Francisquito Canyon*. Santa Clarita, Los Angeles County, California.

Sierra Delta Corporation. 1988. *Biota Report for Zond Systems, Inc., Los Angeles Wind Electric Generating Station, Gorman, California, Conditional Use Permit 86453,* Las Vegas, Nevada.

Skinner, M. W. and B. M. Pavlik. 1994. *California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California*. California Native Plant Society. Special Publication, no. 1, 5th ed. Sacramento, California.

Small, A., 1994. *California Birds: Their Status and Distribution*. Ibis Publishing Company: Vista, California.

Soulé, M. E. 1986. *Conservation Biology: The Science of Scarcity and Diversity*. Sunderland, Massachusetts.

Soulé, M. E. 1991. Land use planning for the maintenance of wildlife in a fragmenting urban landscape. *Journal of the American Planning Association*, Summer 199:312-322.

Soulé, M. E., and M. E. Gilpin. 1991. The theory of wildlife corridor capability. Pages 3-8 in D. A. Saunders and R. J. Hobbs, eds. *Nature Conservation 2: The Role of Corridors*. Surrey Beatty & Sons Pty Limited, Chipping Norton, Australia.

Soulé, M. E., A. C. Alberts, and D. T. Bolger. 1992. The responses of animals and plants to habitat fragmentation in coastal Southern California. *Oikos* 63:39-47.

State of California Resources Agency. 1988. Department of Fish and Game. *California's Wildlife: Volume I: Amphibians and Reptiles*. Sacramento, California.

State of California Resources Agency. 1990. Department of Fish and Game. *California's Wildlife: Volume II: Birds*. Sacramento, California.

State of California Resources Agency. 1990. Department of Fish and Game. *California's Wildlife: Volume III: Mammals*. Sacramento, California.

State of California Resources Agency. 1991. Department of Fish and Game. *California's Fully Protected Birds, Mammals, Reptiles, Amphibians and Fish*. Informational leaflet. Sacramento, California.

State of California Resources Agency. 1992. Department of Fish and Game. *Annual Report on the Status of California's State Listed and Threatened and Endangered Plants and Animals*. Sacramento, California.

State of California Resources Agency. 1992. Department of Fish and Game. *Natural Communities* (1992 update of Holland, 1986). Sacramento, California.

State of California Resources Agency. 1997. Department of Fish and Game. *Endangered and Threatened Animals of California*. Sacramento, California.

State of California Resources Agency. 1999. Department of Fish and Game. *Special Animals List.* Sacramento, California.

State of California Resources Agency. 1999. Department of Fish and Game. Natural Heritage Division. *State and Federally Listed Endangered, Threatened, and Rare Plants of California*. Sacramento, California.

State of California Resources Agency. 1999. Department of Fish and Game. Natural Heritage Division. *Natural Diversity Data Base. Data Base Record Search for Information on Threatened, Endangered, Rare, or Otherwise Sensitive Species and Communities in the Yorba Linda Quandary*. Sacramento, California.

State of California Resources Agency. 1999. Department of Fish and Game. Natural Heritage Division. *List of California Terrestrial Natural Communities Recognized by the Natural Communities Recognized by the Natural Diversity Data Base*. Sacramento, California.

State of California Resources Agency. 1999. Department of Fish and Game. Natural Heritage Division. *State and Federally Listed Endangered and Threatened Animals of California*. Sacramento, California.

State of California Resources Agency. 1999. Department of Fish and Game. Natural Heritage Division. *Special Plants List.* Sacramento, California.

Stebbins, R. C. 1954. *Amphibians & Reptiles of Western North America*. McGraw-Hill, New York, New York.

Stebbins, R. C. 1996. *A Field Guide to Western Reptiles and Amphibians.* Houghton-Mifflin, Boston, Massachusetts.

Stephenson, J. R. and G. M. Calcarone. 1999. *Southern California Mountains and Foothills Assessment: Habitat and Species Conservation Issues.* General Technical Report GTR-PSW-172. Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, Albany, California.

SWCA, INC. Environmental Consultants. 1999. *Draft Status Review of the Mohave Ground Squirrel (Spermophilis mohavensis),* Kern County, California.

Taylor & Company. 1995. *Biota Report: Los Angeles County Project No. 94-129, Soledad Rock Quarry, Surface Mining Permit, Conditional Use Permit,* Los Angeles County, California.

The Urban Land Institute. 1994. Wetlands: *Mitigating and Regulating Development Impacts*.

Thorne, R. F. 1967. A Flora of Santa Catalina Island, California. *Aliso* 6(3):1-77.

Thorne, R. F. 1969. A Supplement to the Floras of Santa Catalina and San Clemente Islands, Los Angeles County, California. *Aliso* 7(1):73-83.

Thorne, R. F. 1976. *Plant Communities of Southern California.* June Latting, ed. California Native Plant Society. Special Publication No. 2. Sacramento, California.

Tierra Madre Consultants. 1990. *Biota Report on Tentative Parcel Maps 19628, 19899, 20056, and 20057.*

U.S. Bureau of the Budget. 1941 (revised 1943, 1947). *National Mapping Standards*. Washington, D.C.

U.S. Department of the Interior. 1982. *The Ecology of Southern California Coastal Marshes: A Community Profile.*

U.S. Department of the Interior, Fish and Wildlife Service. *Compilation and Special Internet Reprint, July 31, 1997; 50 CFR Pt 17 § 17.11 Endangered and Threatened Wildlife and Plants: Endangered and Threatened Wildlife.*

U.S. Department of the Interior, Fish and Wildlife Service. *Federal Register, February 28, 1996;* "50 CFR Part 17 Endangered and Threatened Species: Notice Of Reclassification Of 96 Candidate Taxa."

U.S. Department of the Interior, Fish and Wildlife Service. *Compilation and Special Internet Reprint, July 31, 1997; 50 CFR Pt 17 § 17.12 Endangered and Threatened Wildlife and Plants: Endangered and Threatened Plants.*

U.S. Department of the Interior, Fish and Wildlife Service. *1996. Federal Register.* "50 CFR Pt 17, Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa That Are Candidates for Listing as Endangered or Threatened Species."

U.S. Department of the Interior, Fish and Wildlife Service. 1997. *Vernal Pools of Southern California Draft Recovery Plan*. Portland, Oregon.

U.S. Department of the Interior, Fish and Wildlife Service. 1998. *Draft Recovery Plan for Six Plants from the Mountains Surrounding the Los Angeles Basin, Region One,* Portland, Oregon.

U.S. Department of the Interior, Fish and Wildlife Service. 1999. *Federal Register*. "Endangered and Threatened Wildlife and Plants: Proposed Endangered Status for the Southern California Distinct Vertebrate Population Segment of the Mountain Yellow-Legged Frog; Proposed Rule."

U.S. Department of the Interior, Fish and Wildlife Service. 2000. *Draft Recovery Plan for the red-legged Frog (Rana aurora draytonii)*. Portland, Oregon.

U.S. Department of the Interior, Fish and Wildlife Service. 2000. *Federal Register*. "Endangered and Threatened Wildlife and Plants; Proposed Determination of Critical Habitat for the Coastal California Gnatcatcher; Proposed Rule."

U.S. Department of the Interior, Fish and Wildlife Service et al., *Implementation/Management Agreement Regarding the Metropolitan Bakersfield Habitat Conservation Plan.*

U.S. Department of Agriculture. 1998. *Proceedings of the Symposium on Oak Woodlands and Hardwood Rangeland Management.*

U.S. Department of the Interior, U.S. Geological Survey. Digital Ortho-rectified Quadrangle Photographs.

U.S. Department of the Interior, U.S. Geological Survey. Quadrangle Topographic Maps.

U.S. Department of the Interior, National Park Service. March 1998. *Santa Monica Mountains National Recreation Area Land Protection Plan*, Los Angeles County, California.

Ultrasystems Engineers & Constructors, Inc. Environmental Services. 1991. *Seatac Report. Supplemental Information. Tentative Tract No. 43896*. Dale Poe Development Corporation, Los Angeles County, California.

Ultrasystems Engineers & Constructors, Inc. Environmental Services. 1990. *Biotic Report for Sunshine Mountaine Park, Travel Trailer Park,* Santa Clarita Valley, California.

University of California. *The Grower's Weed Identification Handbook*. Communication Services Publications, Publication 4030, Division of Agriculture and Natural Resources: University of California, Berkeley, California.

Wallace, G. D. 1985. "Vascular Plants of the Channel Islands of Southern California and Guadalupe Island, Baja California, Mexico." *Contributions in Science*, Number 365, Natural History Museum of Los Angeles County pp 1-136.

Yorke, C. D., Ph.D. March 1992. *Biological Resources Report on 10.8 Acres, SEA No. 5 Buffer, Malibu (Project No. 88217),* Los Angeles County, California.

Yorke, C. D., Ph.D. 1989. *Biota Report for Frank Collins, C/O Archer Real Estate, SEA No. 23*, Canyon Country, California.

Yorke, C. D., Ph.D. 1989. *SEATAC Biota Report, APN 3209-14-21, Santa Clara River Buffer Zone SEA 23.*

Yorke, C. D., Ph.D. 1990. *SEATAC Biota Report, APN 3056-12-31, Kentucky Springs, SEA No. 61, Project No. 90113,* Los Angeles County, California.

Yorke, C. D., Ph.D. 1990. *Addendum to Biological Resources Report, Project No. 90113/PM 21856, Kentucky Springs,* Los Angeles County, California.

Yorke, C. D., Ph.D. 1991. *Biological Resources Report on 10.8 Acres, SEA No. 5 Buffer, Malibu (Project No. 88217),* Los Angeles, California.

Yorke, C. D., Ph.D. 1991. *Biological Resources Report on 50 Acres, 2700 Corral Canyon Road, Project No. 90504,* Los Angeles County, California.

Yorke, C. D., Ph.D. 1992. *Biological Resources Report on 50 Acres, 2700 Corral Canyon Road, Malibu, Project No. 90504,* Los Angeles County, California.

Yorke, C. D., Ph.D. 1993. *Response to SEATAC Comments of February 1, 1993, 50 Acres, 2700 Corral Canyon Road, Malibu, Project No. 90-504/TR 50290,* Los Angeles County, California.

Zedler, P. H. 1987. *The Ecology of Southern California Vernal Pools: A Community Profile*. U.S. Fish and Wildlife Service Biological. Report 85(7.11).

APPENDIX G

SEA Nomination Table

Los Angeles County SEA Update Study
SEA Nominations

Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
12-15-99	**Altadena Foothill Conservancy Planning** 153 Jaxine Drive Altadena, CA 91001-3817 Contact: Lori Paul	Nominated a section of the Altadena Foothills in the San Gabriel Mountain foothill corridor, between Arroyo Seco and Hastings Canyon.	A field analysis determined that the Altadena Foothills do not contain biotic resources with significant regional resource values, as those found within the proposed San Gabriel Canyon and San Dimas Canyon/San Antonio Wash SEAs. This area, therefore, is not proposed as an SEA, but may be designated as "Open Space" in the Los Angeles County General Plan.
12-01-99	**Ballona Ecosystem Education Project & Save All of Ballona** 6038 75th St. Los Angeles, CA 90045 Contact: Rex Frankel **Spirit of the Sage Council** 1122 Oak Street Santa Monica, CA 90405 Contact: Kathy Knight	Nominated an expansion of Ballona Creek SEA #29 to include 1,087-acre lowland and 44-acre undeveloped bluff, total acres – 1,130. Pictures, maps, articles and species information on file with DRP in room 1356.	Existing SEA #29, Ballona Creek, was not a part of the study, and it will be retained as originally approved. The analysis of this SEA is undergoing an independent review by a joint County/City of Los Angeles Local Coastal Program study. No changes are proposed to this SEA until an assessment of existing conditions has been completed by this study. Existing SEAs within city boundaries are not a part of the study and are being retained as originally approved. The analysis of this area is also pending an independent review by a joint County/City of Los Angeles Local Coastal Program study. No changes are proposed until an assessment of existing conditions has been completed.
12-07-99	**Brown, David** 5860 Belbert Circle Calabasas, CA 91302 Contact: David Brown	Nominated Solstice Canyon watershed	Solstice Canyon has been consolidated with the proposed Santa Monica Mountains SEA.
12-01-99	**California Department of Parks and Recreation, Angeles Division** 1925 Las Virgenes Road Calabasas, CA 91302 Contact: Russ Dingman, District Planner	The following areas were nominated: • Solstice Canyon watershed area, especially where Corral Canyon and Pacific Coast Highway cross the stream; • Watershed of Arroyo Sequit, approximately 4,500 acres (half of which is state or federal parkland); • Area that borders the northwest side of Malibu Creek State Park; • 32 acre inholding in Malibu Creek State Park; • Liberty Canyon Natural Preserve Area; • An area just east of Malibu Lake; • North slope of Castro Peak; • Bulldog Canyon watershed located along the west side of Malibu Creek State Park; • Expand the Malibu Creek State Park Buffer SEA/April Road; • Additions to the Cold Creek SEA bordering on the west side and the north and northeast sides of the SEA, including Calabasas Peak.	All of the areas nominated have been consolidated with the proposed Santa Monica Mountains SEA.

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SEA Nominations

Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
12-15-99	**California Native Plant Society –** Los Angeles/Santa Monica Mtns. Chapter 3908 Mandeville Canyon Road Los Angeles, CA 90049 Contact: Betsey Landis, Vice President, Education	The following nominations were made for eight Regional SEAs, with boundaries that correspond with major watershed areas and natural drainage channels: • The entire Santa Catalina Island, excluding Avalon, Two Harbors, the Airport, Wrigley Ranch, and some private holdings, which total approximately 42,400 acres;	• The entire Santa Catalina Island, excluding Avalon and other developed areas, has been proposed as an SEA.
		• Western Antelope Valley, Mojave Desert, Portal Ranch, Liebre Mtn., Angeles National Forest, and SEAs #57 (Fairmont and Antelope Buttes), #58 (Portal Ridge/Liebre Mountain), & #60 (Tehachapi Foothills);	• The proposed San Andreas Rift Zone and Joshua Tree Woodland SEAs include existing SEAs #57, #58 and #60 and key biotic resources. Portions of the nomination were not included where field survey found no significant resources. The proposed SEAs do not include Amargosa Creek due to high levels of disturbance along its course through the cities of Palmdale, Quartz Hill, and Lancaster.
		• Little Rock Wash, Big Rock Wash, eastern Mojave, and the northern San Gabriel Mtns. watershed. Located within this area are SEAs #47 (Edwards AFB), #48 (Big Rock Wash), #49 (Little Rock Wash), #50 (Rosamond Lake), #51 (Saddleback Butte State Park), #53 (Lovejoy Butte), #54 (Piute Butte), #55 (Desert – Montane Transect) and the Angeles National Forest;	• Existing SEAs #47, #48, #49, #50, #51, #53, #54, #55, and a substantial portion of the other areas nominated have been included in the proposed Antelope Valley SEA. The proposed SEA differs from the nomination in two ways: 1) Areas within the National Forest are recognized, but are outside the unincorporated jurisdiction. These areas are designated as "Open Space" on the Los Angeles County General Plan Land Use Policy Map and, 2) a northeasterly region was not included.
		• Santa Clara River and its watersheds. Located within this area are SEAs #19 (San Francisquito Canyon), #20 (Santa Susana Mountains), #23 (Santa Clara River), #63 (Lyon Canyon), #64 (Valley Oaks Savannah) and the Angeles National Forest;	• Existing SEAs #19 and #23 along with several other tributaries to the Santa Clara River have been included in the proposed Santa Clara River SEA. Existing SEAs #20, #63, and #64 have been included in the proposed Santa Susana Mountains/Simi Hills SEA. These proposed SEAs do not include large portions of the National Forest and the entire Santa Clara River watershed. Areas within the National Forest are recognized, but are outside the unincorporated jurisdiction; these areas are designated as "Open Space" on the Los Angeles County General Plan Land Use Policy Map. While this study advocates appropriate watershed management practices, a field survey determined that regionally significant biotic resources did not exist in a number of nominated areas.

Los Angeles County SEA Update Study
SEA Nominations

Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
12-15-99 (cont.)	**California Native Plant Society –**	• Santa Monica Mtns., Simi Hills and Baldwin Hills as a wildlife corridor;	• Undeveloped portions of the Santa Monica Mountains, including existing SEAs and connections to the Simi Hills have been proposed as a regional SEA. The Los Angeles County undeveloped portions of the Simi Hills are also included as part of the proposed Santa Susana Mountains/ Simi Hills SEA. Developed areas and/or areas outside of Los Angeles County jurisdiction are not included. These are found in the vicinity of Agoura, the western Santa Monica Mountains, and Baldwin Hills.
		• Los Angeles River System. Located within the watershed area are SEAs #13 (Chatsworth Reservoir), #14 (Simi Hills), #20 (Santa Susana Mountains), #21 (Santa Susana Pass), #24 (Tujunga Valley – Hanson Dam), #33 (Terminal Island), #35 (Harbor Lake Regional Park), #37 (Griffith Park), #40 (Verdugo Mountains), #46 (Tujunga Spreading Grounds) and numerous canyons, creeks and other water channels;	• Existing SEAs #13, #14, #20 and #21 have been incorporated in the proposed Santa Susana Mountains/Simi Hills SEA. SEA #45 has been included in the proposed San Gabriel Canyon SEA. In these cases, proposed SEAs include much larger areas than the existing SEAs. Existing SEAs within city boundaries are not a part of the study and are being retained as originally approved. These include the following existing SEAs: #24, #33, #35, #37 and #40. The Tujunga Spreading grounds (#46), within the City of Los Angeles, was originally identified by the England and Nelson study in 1976 as a prospective SEA; subsequent analysis prior to adoption of the 1980 General Plan revision determined that biotic resources within this area were not significant. Consequently, this area is designated as "Open Space" on the Los Angeles County General Plan. The "Open Space" designation will be retained. Further, the Los Angeles River system is not proposed as part of an SEA due to its channelized condition within highly urbanized areas.
		• San Gabriel Valley River System. Located within the watershed area are SEAs #15 (Tonner Canyon – Chino Hills), #16 (Buzzard Peak – San Jose Hills), #17 (Powder Canyon – Puente Hills), #22 (Santa Fe Dam Floodplain), #25 (San Dimas Canyon), #26 (San Antonio Cyn Mouth), #30 (Alamitos Bay), #41 (Rio Hondo Spreading Grounds), #42 (Whittier Narrows), #43 (Rio Hondo College), #44 (Sycamore – Turnbull Canyons), #45 (*Dudleya Densiflora* Population) and Frank G. Bonnelli County Park;	• Existing SEAs #15, #16, #17, #25, #26, #42, #44, #45, and a substantial portion of other areas nominated have been incorporated into either the proposed Puente Hills SEA, the proposed East San Gabriel Valley SEA, the proposed San Gabriel Canyon SEA, or the proposed San Dimas Canyon/ San Antonio Wash SEA. In these cases, proposed SEAs include much larger areas than the existing SEAs. However, most of the remaining undeveloped portions of the nominated SEA are entirely outside lands within County jurisdiction including existing SEA #30. Existing SEAs within city boundaries are not a part of the study and are

Los Angeles County SEA Update Study
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Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
12-15-99 (cont.)	**California Native Plant Society –**		being retained as originally approved. The Rio Hondo Spreading Grounds (#46) within the City of Industry, was originally identified by the England and Nelson study in 1976 as a prospective SEA; subsequent analysis prior to adoption of the 1980 General Plan revision determined that biotic resources within this area were not significant. Consequently, this area is designated as "Open Space" on the Los Angeles County General Plan. The "Open Space" designation will be retained. Existing SEA #22 was not proposed due to isolation by surrounding development and lack of long-term sustainability. Based on field study, SEA #43 is isolated from the proposed Puente Hills SEA and does not contribute significantly to regional biological value. Therefore, SEA #43 is not proposed to be retained in this study. Finally, the San Gabriel River has been designated as "Open Space" in the Los Angeles County General Plan. The Open Space designation will be retained.
		• Palos Verdes Peninsula and coastline from the peninsula to El Segundo Dunes. Located in this watershed area are SEAs #27 (Portuguese Bend Landslide), #28 (El Segundo Dunes), #31 (Rolling Hills Canyons), #32 (Agua Amarga Canyon), and #34 (Palos Verdes Peninsula Coastline). Specific comments pertaining to existing SEAs also included the following:	• None of the existing SEAs or other open space referenced are proposed as part of the update study due to either their location entirely outside of lands within County jurisdiction or the lack of significant biological resources. It is important to note, however, that existing SEAs within city boundaries are being retained as originally approved.
		• Eliminate SEA #18 (Way Hill) and establish Frank G. Bonelli County Park as an SEA.	• Existing SEA #18 is not proposed as part of this update study due to disturbance which has eliminated the population of *Dudleya multicaulis*, for which the SEA was originally designated. Frank G. Bonelli County Park has been consolidated into the proposed East San Gabriel Valley SEA.
		• Retain SEA #36 (Madrona Marsh)	• SEA # 36 is located outside of the unincorporated jurisdiction. Existing SEAs within city boundaries are not a part of the study and are being retained as originally approved.
2-10-00	**Diamond Bar East Partners** 3480 Torrance Boulevard, Suite 300 Torrance, CA 90503 Contact: Kurt Nelson	Opposes the inclusion of two graded and developed properties in Diamond Bar within the area nominated by the Wildlife Corridor Conservation Authority.	The proposed Puente Hills SEA includes most of the open space remaining in the unincorporated portion of the Puente Hills and Chino Hills area; the SEA also includes natural areas of the Whittier Narrows Recreation and Flood Control Basin. Existing Seas #15, #42, and #44 are consolidated with the SEA with minor boundary modifications. The focus of this study

Los Angeles County SEA Update Study
SEA Nominations

Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
			and the proposed SEAs is on regionally sustainable areas with regionally significant biotic resources.
12-15-99	**Endangered Habitats League** PMB 592, 8424-A Santa Monica Blvd. Los Angeles, CA 90069-4267 Contact: Dan Silver, Coordinator	Would like Los Angeles County to take a more forward-thinking and comprehensive approach to protecting natural habitats. Suggested Riverside County's Multiple Species Habitat Conservation Plan as a model.	In addition to maintaining biological diversity throughout the County, the SEA Update Study emphasized current approaches to conservation biology, including a multi-species approach, larger SEA designations, and the need for connectivity.
12-09-99	**Environment Now** 11777 San Vicente Blvd, Suite 555 Los Angeles, CA 90049 Contact: David Myerson, Park to Playa Coordinator	Nominated Baldwin Hills area located in West Los Angeles, south of Jefferson Blvd, west of La Brea Avenue, north of Slauson Avenue and east of Jefferson Blvd., which totals approximately 800 acres of open space. This area could be linked to the Ballona Creek SEA.	Baldwin Hills is a highly disturbed area that was included as a prospective SEA under the England and Nelson Study in 1976, based on likely restoration. Subsequent analysis, prior to adoption of the 1980 General Plan revision determined that biotic resources within this area were not significant. The area was designated in the Los Angeles County General Plan as "Open Space." Circumstances have not changed since 1980 and the area remains of limited significant biotic value. Designation as an SEA is, therefore, not proposed; the "Open Space" designation will be retained.
03-31-00	**Friends of the Santa Clara River** 660 Randy Drive Newbury Park, California 91320-3036 Contact: Ron Bottroff, Chair	Supports the California Native Plant Society nomination of a regional SEA including the slopes and drainages that comprise the watershed of the Santa Clara River in Los Angeles County.	See California Native Plant Society.
11-24-99	**Garris, Judy** 7402 Remmet Avenue Canoga Park, CA 91303 Contact: Judy Garris	Nominated the Santa Susana Mountains and the Simi Hills.	The undeveloped portions of the Santa Susana Mountains and the Simi Hills located within Los Angeles County are proposed as a single regional SEA.
11-15-99	**Hacienda Heights Improvement Assoc.** 1622 S. Adalia Avenue Hacienda Heights, CA 91745 Contact: Jeff Yann, Environmental Chair	Expressed support for a large SEA that encompasses the Puente/Chino Hills Wildlife Corridor (see submittal by the Puente/Chino Hills Wildlife Corridor Conservation Authority) and retention of SEAs #17 (Powder Canyon/Puente Hills) and #44 (Sycamore and Turnbull Canyons). Specifically nominated the addition of three areas adjacent to SEA #44: • Canyons south & west of Seventh & Orange Grove Avenues; • Canyons on the south slope of Oak Canyon; • Canyon on the west end of Vallecito to Workman Hill.	SEAs #17 and #44 have been retained within a much larger area proposed as the Puente Hills SEA. The majority of the three nominated areas have been included as well.

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Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
11-22-99	**Los Cerritos Wetlands Task Force** 5710 East Seventh St., Suite 168 Long Beach, CA 90803 Contact: Don May, President	Relist the Los Cerritos Wetland as an SEA. This would be an 85-acre parcel, much smaller than the original 2,400 acre San Gabriel River Estuary. It is more accurately described as the Los Cerritos Tidal Salt Marsh located in the southeast corner of Long Beach. (submittal included a video tape)	This area was not considered for designation as a County SEA due to its location entirely within the City of Long Beach.
12-21-99	**Monrovia Mountain Conservancy** PO Box 522 Monrovia, CA 91017 Contact: Stephanie Granger Kurzweil, President	Supports the Monrovia mountains and foothills as a SEA.	Undeveloped portions of the Monrovia mountains and foothills have been incorporated into the proposed San Gabriel Canyon SEA.
12-20-99	**National Audubon Society** 6042 Monte Vista Street Los Angeles, CA 90042 Contact: Mike San Miguel	Nominated approximately 27 acres adjacent to the Santa Anita Wash, at the mouth of Santa Anita Canyon, in the City of Arcadia.	Whereas, the mouths of several other canyons exiting the San Gabriel Mountains have been proposed as SEAs, the nominated area was not due to its location within an active groundwater recharge facility. However, Santa Anita Canyon upstream of the Dam is proposed as part of the San Gabriel Canyon SEA.
11-30-99	**Natural History Club of Acton/Agua Dulce** PO Box 965 Acton, CA 93510 Contact: Stacey Nickels, President	Nominated the entire area of the Santa Clara River including a buffer from its headwaters in the San Gabriel Mountains, east of Acton, to the City of Santa Clarita limits, west of Agua Dulce. Also, include Vasquez Rocks County Park in the SEA.	The proposed Santa Clara River SEA includes the Santa Clara River, several tributary drainage areas, adjacent buffer area and Vasquez Rocks County Park.
3-15-00	**Puente Hills Landfill Native Habitat Conservation Authority** 1955 Workman Mill Road Whittier, CA 90601 Contract: Bob Henderson, Chair	Requested the active disposal area of the Puente Hills Landfill, as included in the area nominated by the Wildlife Corridor Conservation Authority, be removed from SEA consideration.	In drafting the boundaries of the proposed Puente Hills SEA, active disposal areas, as evident from recent aerial photography, were excluded from SEA consideration. Based on past approvals, certain areas are already approved for SEA status.
11-16-99	**Resource Conservation District of the Santa Monica Mountains** 122 North Topanga Canyon Blvd. Topanga, CA 90290 Contact: Rosi Dagit	Suggested that the most appropriate way to afford protection of region-wide resources would be to create a Santa Monica Mountains SEA which included all undeveloped lands that are not already under public ownership. Specifically, focused on the following areas: • Lower Topanga Canyon; • Upper areas of Old Topanga Canyon (sub-drainage); • Expand Tuna Canyon SEA (#10) to include all adjacent significant portions of the watershed and Little Las Flores Canyon.	A Santa Monica Mountains SEA similar to the nominated is proposed, including existing SEA #3 (Zuma Canyon), #3A (Buffer), #3B (Buffer), #4 (Upper La Sierra Canyon), #5 (Malibu Canyon and Lagoon), #B5 (Buffer), #6 (Las Virgenes), #8 (Malibu Creek State Park Buffer Area), #9 (Cold Creek), #10 (Tuna Canyon), #11 (Temescal-Rustic-Sullivan Canyons), #12 (Palo Comado Canyon) and #39 (Encino Reservoir), and additional areas considered.

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Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
12-14-99	**San Gabriel Mountains Regional Conservancy** (SGMRC) PO Box 963 Glendora, CA 91740 Contact: Dr. Ann Croissant	Recommended that SEA designation take a more strategic regional approach pointing out the need to protect watershed and wildlife corridor areas. Example SEAs based on this approach include: • San Gabriel Foothills and Mountains • San Gabriel River and its tributaries • San Gabriel Valley ridgelines	For the reasons suggested, the San Gabriel Mountain Foothills, the Puente Hills, and the East San Gabriel Valley SEAs are proposed. The analysis also determined that the San Gabriel River and its tributaries are channelized; under these circumstances an SEA designation is not appropriate, though the river can be designated as "Open Space" in the Los Angeles County General Plan.
11-14-99	**Santa Monica Mountains Task Force / Sierra Club Angeles Chapter** PO Box 344 Woodland Hills, CA 91365-0344 Contact: David Brown	Nominated the following areas: • Five acres along Malibu Creek State Park; • Area between Ventura Freeway & Liberty Canyon; • Area between Castro Park, Malibu Creek State Park, Malibu Lake Community, & Peter Strauss Ranch; • Solstice Canyon rises on Castro Park; • Watershed of Arroyo Sequit; • West border of Cold Creek SEA.	All of the nominated areas have been consolidated into the proposed Santa Monica Mountains SEA.
12-02-99	**Santa Susana Mountain Park Assoc.** 5922 Corbin Avenue Tarzana, CA 91356 Dorian Keyser, Vice-President and Lands Committee Chair	Retain and expand SEAs #14 (Simi Hills) and #13 (Chatsworth Reservoir) to insure the inclusion of the Chatsworth Nature Preserve/Reservoir and portions of Simi Hills. Expand the Santa Susana Pass State Historic Park.	Existing SEAs #13 and #14 have been consolidated into the proposed Santa Susana Mountains/Simi Hills SEA.
12-13-99	**SCOPE Santa Clarita Organization for Planning the Environment** PO Box 1182 Santa Clarita, CA 91386 Contact: Michael Kotch	The following comments were provided: • Supports the Sierra Club's nomination of the three adjacent watersheds in Elsmere, Whitney and Placerita Canyons east of the 14 Freeway as one SEA; • Request that an additional criterion be added to the program: aquifer re-charge areas; • Oppose any SEA reduction.	• These canyons have been consolidated into the proposed Santa Clara River SEA. • An analysis of aquifer re-charge areas, as a distinct criterion, was beyond the scope of the SEA update study. It should be noted, however, that biological/ hydrological relationships were used in part to delineate the boundaries of the proposed Antelope Valley SEA. • As a general approach, consistent with current conservation planning practices, proposed SEAs include existing SEAs, as well as expanses of land in between these areas; consolidating areas situated between SEAs provides connectivity. Following this approach, the area of SEAs were significantly increased in size. Reduction of SEAs occurred only rarely in unincorporated Los Angeles County, where development or reduction of biotic resources failed to justify retainment of the SEA designation.

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Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
12-07-99	**Scully, Marcia** 6292 Hillside Lane Whittier, CA 90601-3832 Contact: Marcia Scully	All open space within the jurisdiction of the Whittier/ Puente Hills Conservation Authority, generally delineated by I-605 on the west, SR-60 on the north, Hacienda Boulevard on the east, and Whittier Boulevard on the south.	The majority of the open space within the nominated area has been included in the proposed Puente Hills SEA.
9- 21-99	**Sierra Club – Santa Clarita Valley & SCV Canyons Preservation Committee** 26617 Gavilan Drive Santa Clarita, CA 91350 Contact: Karen Pearson	Nominated: • Whitney Canyon • Elsmere Canyon • Placerita Canyon (combined, these areas total 4,390 acres).	These canyons have been consolidated into the proposed Santa Clara River SEA.
11-22-99	**Sierra Club,** **Angeles Chapter Conservation Committee** 3435 Wilshire Blvd., Ste. 320 Los Angeles, CA 90010-1904 Contact: Kevin Finny, Vice Chair	Sierra Club endorsed nominations included: • Puente / Chino Hills Wildlife Corridor (a 30 mile corridor extending to the Cleveland National Forest). The boundary would include Tonner Canyon to Whittier Narrows. • Elsmere Canyon, Whitney Canyon and Placerita Canyon, which would represent the last wildlife corridor between the Santa Susana and San Gabriel Mountains. This corridor would encompass the watersheds of Elsmere, Whitney and Placerita Canyons from Highway 14 to the Angeles National Forest boundary. • Eastern Desert SEA linking the desert Montane transect with Big Rock Wash, Butte Complex and Little Rock Wash to Edwards Airforce Base and Rosamond Lake. • Watershed area of Solstice Canyon and two tributary canyons. • California Buckeye Grove on the south slope of Oak Canyon in Hacienda Heights. • Western Desert SEA, which would link the San Francisquito watershed buffer with Portal Ridge to the Butte Complex and Joshua Tree Woodlands through northern drainages.	• The proposed Puente Hills SEA embodies this nomination within Los Angeles County. • These canyons have been incorporated into the proposed Santa Clara River SEA. • The proposed Antelope Valley SEA embodies this nomination. • This area has been incorporated into the proposed Santa Monica Mountains SEA. • This area has been incorporated into the proposed Puente Hills SEA. • The proposed Santa Clara River SEA includes San Francisquito Creek until it is “cut-off” by development in Green Valley. The Portal Ridge/Butte complex is consolidated with the proposed San Andreas Rift Zone SEA. The consolidation of these areas provides a connection to the Angeles National Forest. The proposed Joshua Tree Woodland SEA is not linked due to intervening disturbances.

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Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
11-22-99 (cont.)	**Sierra Club, Angeles Chapter Conservation Committee**	• Increase SEA #64 (Valley Oak Savannah) to include the area along the freeway adjacent to Dale Poe Parkway.	• The existing SEA and additional area have been incorporated into the proposed Santa Susana Mtns./Simi Hills SEA.
		• Link a canyon extending from the end of Vallecito Drive in Hacienda Heights to Workman Hill with the adjacent Turnbull/Worsham Canyon SEA #44.	• The proposed Puente Hills SEA includes this nomination.
		• Broaden the Santa Clara River SEA to include watersheds Cruzan Mesa and Bouquet Canyon.	• The proposed Cruzan Mesa Vernal Pool SEA covers most of the Cruzan Mesa region. Bouquet Canyon was not considered due to disturbance by development.
		• Arroyo Sequit in Leo Carillo State Park.	• This area has been consolidated into the proposed Santa Monica Mountains SEA.
		• Three canyons southwest of Seventh and Orange Grove Avenues in Hacienda Heights.	• These canyons have been included within the proposed Puente Hills SEA.
		• Increase the size of the Ballona Wetlands SEA.	• Existing SEA #29, Ballona Creek, was not a part of the study, and it will be retained as originally approved. The analysis of this SEA is undergoing an independent review by a joint County/City of Los Angeles Local Coastal Program study. No changes are proposed to this SEA until an assessment of existing conditions has been completed by this study. Existing SEAs within city boundaries are not a part of the study and are being retained as originally approved. The analysis of this area is also pending an independent review by a joint County/City of Los Angeles Local Coastal Program study. No changes are proposed until an assessment of existing conditions has been completed.
		• Simi Hills including linkages to Chatsworth Reservoir, Santa Susana Pass and Santa Susana Mountains.	• The nominated areas have been consolidated with the proposed Santa Susana Mountains/Simi Hills SEA.
		• Chatsworth Reservoir.	• The nominated area is outside of the unincorporated jurisdiction. However, the Chatsworth Reservoir has been consolidated with the proposed Santa Susana Mountains/Simi Hills SEA.
		• Soft bottom portions of the Los Angeles River, Sepulveda Dam and Glendale Narrows, including linkages to the Arroyo Seco through Mt. Washington.	• "Chatsworth Reservoir, the nomination area, is currently designated as SEA #13. While this SEA was not a part of the study, because it was outside the unincorporated area, proposed modifications to the boundaries of existing Simi Hills SEA #14 has resulted in linking of SEA #13 with the

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Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
11-22-99 (cont.)	**Sierra Club, Angeles Chapter Conservation Committee**		expanded and combined Santa Susana Mountains/Simi Hills SEA.
		• Least Tern nesting grounds at the mouth of the Los Angeles River.	• This area has not been included in the update study due to its location entirely outside County jurisdiction. The nominated area is within the City of Los Angeles. In correspondence dated October 19, 1999, the City recommended that existing SEA #33 (Terminal Island) be relocated to new land created in the outer harbor area. According to the City, this recommendation was made by the U.S. Fish and Wildlife Service, and State Department of Fish and Game.
		• Soft bottom portions of the San Gabriel River extending from Whittier Narrows to Angeles National Forest.	• The analysis determined that the San Gabriel River and its tributaries are channelized; under these circumstances an SEA designation is not appropriate, though the river can be designated as "Open Space" in the Los Angeles County General Plan.
		• Worsham Canyon should be fully included within the boundary of SEA #44 (Sycamore – Turnbull Canyons).	• Worsham Canyon has been consolidated with the proposed Puente Hills SEA.
		• Beaches and Dune remnants from Marina del Rey to the Palos Verdes Peninsula.	• See California Native Plant Society.
		• Add the Liberty Canyon Wildlife Corridor to the Las Virgenes SEA to link the Santa Monica Mountains to the Simi Hills and Santa Susana Mountains.	• The undeveloped portions of this area have been included within the proposed Santa Monica Mountains SEA.
		• Recharge areas of the Santa Clara River that lie outside the current boundaries of SEA #23 (Santa Clara River).	• Existing SEAs #19 and #23 along with several other tributaries to the Santa Clara River have been included in the proposed Santa Clara River SEA. Existing SEAs #20, #63, and #64 have been included in the proposed Santa Susana Mountains/Simi Hills SEA. These proposed SEAs do not include large portions of the National Forest and the entire Santa Clara River water-shed. While this study advocates appropriate watershed management practices, a field survey determined that significant biotic resources did not exist in a number of nominated areas.
		• Isolated habitats on Palos Verdes Peninsula.	• See California Native Plant Society.
		• Revise Malibu Creek State Park Buffer (SEA #8).	• This area has been consolidated into the proposed Santa Monica Mountains SEA.

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Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
11-22-99 (cont.)	**Sierra Club, Angeles Chapter Conservation Committee**	• Canyon that extends from Nicoya Drive in Hacienda Heights to Powder Canyon (SEA #17).	• The nominated area is included in the proposed Puente Hills SEA.
		• Wildlife Corridor extending from San Dimas Canyon and the San Antonio Canyon floodplain south through Bonnelli Park and Upper Tonner Canyon to interconnect with Puente/Chino Hills Corridor.	• The proposed East San Gabriel Valley SEA serves this purpose.
		• Add north side of Castro Peak to SEA #4 (Upper Sierra Cyn.)	• This area has been consolidated into the proposed Santa Monica Mountains SEA.
		• Wildlife corridor extending along Mulholland Scenic Parkway to Hollywood Reservoir and Griffith Park.	• The proposed Santa Monica Mountains SEA extends east to the Encino Reservoir/Temescal-Rustic-Sullivan Canyons area. Areas further to the east were not considered for SEA status due to existing development and numerous high traffic volume freeways. The remaining area was outside of the unincorporated jurisdiction. It is important to note, however, that existing SEAs within city boundaries are not a part of the study and are being retained as originally approved.
		• San Martinez Grande Canyon watershed near Val Verde	• This proposed linkage was not included due to its location in the Newhall Ranch project area. Environmental review determined that linkages further to the west within Ventura County serve this purpose; the area within Ventura County, along the Santa Clara River, is also located closer to the National Forest, which is generally not developed.
07-01-99	**United States Department of the Interior Bureau of Land Management: West Mojave Interagency Planning Team** 2601 Barstow Road Barstow, CA 92311 Contact: Lawrence F. LaPre, PhD	Provided the following comments: • Recommend expansion of SEA #48 (Big Rock Wash); • Add 160 acres Northeast of SEA #51 (Saddleback Butte); • Adjust boundaries of SEA #54 (Piute Butte); • Link SEAs #57 (Fairmont – Antelope Buttes), #58 (Portal Ridge – Liebre Mtns.), and #60 (Joshua Tree Woodland); • Support SEAs #47 (Edwards AFB), #50 (Rosamond Lake), #52 (Alpine Butte), #53 (Lovejoy Butte), and #55 (Desert Montane Transect).	Areas nominated for expansion and linkage are consolidated in the proposed Antelope Valley, San Andreas Rift Zone and Joshua Tree Woodland SEAs.

Los Angeles County SEA Update Study
SEA Nominations

Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
07-25-99	**United States Department of the Interior, National Park Service - Santa Monica Mountains National Recreation Area** 401 West Hillcrest Drive Thousand Oaks, CA 91360-4207 Contacts: Arthur E. Eck, Superintendent Melanie Beck, Outdoor Recreational Planner	Nominated the Santa Monica Mountains as a full Mountain range, including all existing SEAs. Stressed the importance of north-south linkages to connect with the Simi Hills, east-west linkages through the Santa Monica Mountains, and additions to core habitat areas.	Essentially, the entire mountain range, including all existing SEAs, (#3 (Zuma Canyon), #4 (Upper La Sierra Canyon), #5 (Malibu Canyon and Lagoon), #6 (Las Virgenes), #7, #8 (Malibu Creed State Park Buffer Area), #9 (Cold Creek), #10 (Tuna Canyon), #11 (Temescal-Rustic-Sullivan Canyons), #12 (Palo Comado Canyon), and #39 (Encino Reservoir) as well as linkages with the Simi Hills have been consolidated into the proposed Santa Monica Mountains SEA. The proposed SEA also includes linkages to the Simi Hills across the Ventura County line.
12-06-99	**Wampole, Barbara** 28006 San Martinez Grande Road Saugus, CA 91384	Nominated a corridor linking the Santa Clara River to Los Padres and Angeles National Forest lands, west of the communities of Val Verde and Castaic.	This proposed linkage was not included due to its location in the Newhall Ranch project area. Environmental review determined that linkages further to the west within Ventura County serve this purpose; the area within Ventura County, along the Santa Clara River, is also located closer to the National Forest, which is generally not developed.
12-20-99	**Wildlife Corridor Conservation Authority** 2500 East Imperial Highway, #201-357 Brea, CA 92821 Contact: Jennifer Schlotterbeck, Staff Analyst Additional information for the Whittier-Puente Hills SEA nomination	Nominated a Whittier-Puente Hills Wildlife Corridor (especially the areas between SEA #44 (Sycamore-Turnbull Canyons) and #17 (Powder Canyon)). The corridor encompasses existing open space within the Chino Hills & Puente Hills from the Cleveland National Forest in Orange County to the Whittier Narrows area in Los Angeles County.	As proposed, the Puente Hills SEA includes the majority of open space remaining in the county portion of the Puente Hills and Chino Hills and the natural areas of the Whittier Narrows Recreation Area and Flood Control Basin. Existing SEAs #15 (Tonner Canyon-Chino Hills), #17, #42 (Whittier Narrows), and #44 are included in this SEA with minor modifications to their boundaries.
10-22-99	**Wilmington-Harbor City Harbor Lake Regional Park** 221 South Figueroa Street Los Angeles, CA 90012 Contact: Anne Howell	Requested retention of SEA #35 (Harbor Lake Regional Park) (possibly reduce to just the drainage channel).	The nominated area is within the City of Los Angeles. In correspondence dated October 19, 1999, the City noted that existing SEA #35 (Harbor Lake Regional Park) is zoned as OS (Open Space Publicly Owned) and is in park use. The city also recommended deleting the area northerly of Pacific Coast Highway, due to channelization for flood control purposes as well as existing residential development.

Los Angeles County SEA Update Study
SEA Nominations

Date:	Respondent:	Comments/ Area(s) Nominated:	Response:
04-10-00	**United States Department of Agriculture** National Forest Service – Angeles National Forest 701 North Santa Anita Avenue Arcadia, CA 91006-2725 Contact: Susan R. Swinson, Acting Forest Supervisor	Expressed support of the regional SEA concept submitted by the California native Plant Society in December 1999.	See California Native Plant Society.
03-15-00	**The Theodore Payne Foundation for Wildflowers and Native Plants, Inc.** 10459 Tuxford Street Sun Valley, CA 91352 Contact: Michael Sorich, President of the Board of Directors	Expressed support of the regional SEA concept submitted by the California native Plant Society in December 1999.	See California Native Plant Society.
12-16-99	**State of California, The Resources Agency – Santa Monica Mountains Conservancy** 5750 Ramirez Canyon Road Malibu, CA 90265 Contact: Elizabeth A. Cheadle, Chairperson	Expressed support for the nominations submitted by the National Park Service, The Resource Conservation District of the Santa Monica Mountains, the Wildlife Corridor Conservation Authority, the City of Santa Clarita/Sierra Club Santa Clarita Chapter, and the Sierra Club—Angeles Chapter.	See National Park Service, the Resource Conservation District of the Santa Monica Mountains, the Wildlife Corridor Conservation Authority, the City of Santa Clarita/Sierra Club Santa Clarita Chapter, and the Sierra Club—Angeles Chapter.
02-10-00	**Desert Tortoise Preserve Committee, Inc.** 4067 Mission Inn Avenue Riverside, CA 92501 Contact: Michael J. Conner, Ph.D., Executive Director	Expressed support of the regional SEA concept submitted by the California Native Plant Society in December 1999. Specifically recommended SEA status for the designated critical habitat for the desert tortoise and Saddleback Butte State Park in the northeastern corner of the county.	See California Native Plant Society. In addition, a portion of the Critical Habitat Area is located in Saddleback Butte Park, which has been consolidated in the proposed Antelope Valley SEA. This study, nevertheless, recommends expansion of the proposed SEA boundaries to include the majority of the Desert Tortoise Critical Habitat Area within Los Angeles County.

Appendix H

Comprehensive Floral and Faunal Compendium

APPENDIX H
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FLORAL COMPENDIUM H-1
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	VASCULAR PLANTS–Gymnosperms		SIGNIFICANT ECOLOGICAL AREAS											
	Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
	Cupressaceae	**Cypress Family**												
*	*Calocedrus decurrens*	incense cedar	X	X	X					X	X			
	Cupressus arizonica	Arizona cypress		X										
	Juniperus californica	California juniper	X	X	X	X			X					
	Ephedraceae	**Ephedra Family**												
	Ephedra californica	desert tea	X	X	X	X								
	Ephedra nevadensis	Nevada tea	X	X	X	X		X						
	Ephedra viridis	green ephedra	X	X	X	X		X						
	Pinaceae	**Pine Family**												
	Abies concolor	white fir		X										
	Pinus attenuata	knobcone pine						X		X	X			
	Pinus contorta	lodgepole pine												X
*	*Pinus coulteri*	coulter pine	X	X				X		X	X			
	Pinus jefferyi	Jeffery pine	X	X						X	X			
	Pinus lambertiana	sugar pine	X	X						X	X			
	Pinus monophylla	single-leaf pinyon pine	X	X						X	X			

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VASCULAR PLANTS–Gymnosperms		SIGNIFICANT ECOLOGICAL AREAS											
Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Pinus ponderosa	ponderosa pine	X	X						X	X			
Pinus sabiniana	gray or foothill pine	X	X	X			X						
Pseudotsuga macrocarpa	bigcone spruce	X	X	X			X		X	X			

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VASCULAR PLANTS–Ferns and Fern Allies		SIGNIFICANT ECOLOGICAL AREAS											
Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Aspleniaceae	**Spleenwort Family**												
Asplenium vespertinum		X						X	X	X	X	X	
Azollaceae	**Mosquito Fern Family**												
Azolla filiculoides	duckweed fern	X	X	X	X	X	X	X	X	X	X	X	X
Blechnaceae	**Deer Fern Family**												
Woodwardia fimbriata	giant chain fern		X	X			X	X	X	X	X	X	X
Dennstaedtiaceae	**Bracken Family**												
Pteridium aquilinum	Bracken fern	X	X	X		X	X	X	X	X	X	X	X
Dryopteridaceae	**Wood Fern Family**												
Cystopteris fragilis	fragile fern		X	X			X	X	X	X	X	X	X
Dryopteris arguta	coastal wood fern	X	X	X			X	X	X	X	X	X	X
Equisetaceae	**Horsetail Family**												
Equisetum hyemale	common scouring-rush	X	X	X		X	X	X	X	X	X	X	X
Equisetum laevigatum	smooth scouring-rush	X	X	X			X	X	X	X	X	X	X
Equisetum telmateia	giant horsetail		X				X	X			X	X	X
Marsileaceae	**Marsilea Family**												
Marsilea vestita	hairy pepperwort		X				X	X	X	X	X	X	
Pilularia americana			X				X	X	X	X	X	X	

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Ophioglossaceae	**Adder's-tongue Family**												
Botrychium crenulatum	scalloped moonwort	X	X					X	X	X	X	X	X
Ophioglossum californicum	California adder's tongue							X	X	X	X	X	
Polypodiaceae	**Polypody Family**												
Polypodium californicum	California polypody	X	X	X		X	X	X	X	X	X	X	X
Pteridaceae	**Brake Family**												
Adiantum capillus-veneris	southern maiden-hair	X	X	X		X	X	X				X	X
Adiantum jordanii	California maidenhair	X	X	X		X	X	X	X	X	X	X	X
Aspidotis californica	California lace fern	X	X	X		X	X	X	X	X	X	X	X
Cheilanthes clevelandii	Cleveland's lip fern										X	X	
Cheilanthes covillei		X	X	X		X	X	X	X	X	X	X	X
Cheilanthes newberryi		X	X	X		X	X	X	X	X	X	X	X
Notholaena californica		X					X	X			X	X	X
Pellaea andromedifolia	coffee fern	X	X	X		X	X	X	X	X	X	X	X
Pellaea mucronata	birds-foot fern	X	X	X		X	X	X	X	X			
Pentagramma triangularis	goldenback fern		X	X			X	X	X	X	X	X	X
Selaginellaceae	**Spike-Moss Family**												
Selaginella asprella	bluish spike-moss	X	X										
Selaginella bigelovii	Bigelow's spike-moss	X	X	X			X	X	X	X	X	X	X

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Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Thelypteridaceae	**Thelypteris Family**												
Thelypteris puberula	Sonoran maiden fern							X	X	X	X	X	X

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	VASCULAR PLANTS–Angiosperms (Dicotyledons)		SIGNIFICANT ECOLOGICAL AREAS											
	Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
	Aceraceae	**Maple Family**												
	Acer macrophyllum	big-leaf maple	X	X	X		X	X	X	X	X	X	X	X
	Acer negundo	California box-elder	X	X	X			X	X	X	X	X	X	
	Amaranthaceae	**Amaranth Family**												
*	*Amaranthus albus*	tumbleweed	X	X	X	X	X	X	X	X	X	X	X	X
	Amaranthus blitoides	prostrate amaranth	X	X	X	X	X	X	X	X	X	X	X	X
	Amaranthus californicus	California amaranth	X	X	X	X	X	X	X	X	X	X	X	X
*	*Amaranthus deflexus*	low amaranth	X	X	X	X	X	X	X	X	X	X	X	X
	Amaranthus fimbriatus	fringed amaranth	X	X		X								
*	*Amaranthus hybridus*	slender pigweed	X	X	X	X	X	X	X	X	X	X	X	X
	Amaranthus palmeri	Palmer's amaranth	X	X		X								
*	*Amaranthus retroflexus*	rough pigweed	X	X	X	X	X	X	X	X	X	X	X	X
	Anacardiaceae	**Sumac or Cashew Family**												
	Malosma laurina	laurel sumac	X	X	X		X	X	X	X	X	X	X	X
	Rhus integrifolia	lemonade berry	X	X	X		X	X	X	X	X	X	X	X
	Rhus ovata	sugar bush	X	X	X		X	X	X	X	X	X	X	X
	Rhus trilobata	skunkbrush (squawbush)	X	X	X		X	X	X	X	X	X	X	X
	Toxicodendron diversilobum	poison oak	X	X	X		X	X	X	X	X	X	X	X

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	Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
	Apiaceae	**Carrot Family**												
*	*Anthriscus caucalis*	bur-chervil	X	X	X		X	X	X	X	X	X	X	X
	Apiastrum angustifolium	wild celery	X	X	X		X	X	X	X	X	X	X	X
*	*Apium graveolens*	celery	X	X	X	X	X	X	X	X	X	X	X	X
	Berula erecta	cutleaf waterparsnip	X	X	X		X	X	X	X	X	X	X	X
	Bowlesia incana	bowlesia	X	X	X	X	X	X	X	X	X	X	X	X
*	*Ciclospermum leptophyllum*	marsh-parsley	X	X	X		X	X	X	X	X	X	X	X
	Cicuta douglasii	western water hemlock						X	X	X	X	X	X	X
*	*Conium maculatum*	poison hemlock	X	X	X	X	X	X	X	X	X	X	X	X
*	*Coriandrum sativum*	coriander	X	X	X		X	X	X	X	X	X	X	X
	Cymopterus deserticola	desert cymopterus	X	X		X								
*	*Daucus pusillus*	rattlesnake weed	X	X	X	X	X	X	X	X	X	X	X	X
	Eryngium aristulatum	San Diego button-celery					X	X	X	X	X	X	X	X
*	*Foeniculum vulgare*	fennel	X	X	X	X	X	X	X	X	X	X	X	X
	Heracleum lantanum	cow parsnip	X	X	X	X	X	X	X	X	X	X	X	X
*	*Hydrocotyle moschata*							X	X					
	Hydrocotyle umbellata		X	X	X		X	X	X	X	X	X	X	X
	Lomatium californicum		X	X	X			X	X					
	Lomatium dasycarpum	woolly-fruited lomatium	X	X	X		X	X	X	X	X	X	X	X

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Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Lomatium dissectum var. *multifidum*		X	X	X		X	X	X	X	X	X	X	X
Lomatium insulare	San Nicolas Island lomatium												X
Lomatium lucidum	shiny lomatium	X						X	X	X	X	X	
Lomatium mohavense	lomatum	X	X	X	X	X	X	X					
Lomatium nevadense var. *parishii*			X				X		X	X			
Lomatium utriculatum	common lomatium		X	X		X	X	X			X	X	X
Oenanthe sarmentosa	dropwort							X	X	X	X	X	X
Oreonana vestita	woolly mountain-parsley	X							X	X			
Osmorhiza brachypoda	California sweet Cicely (osmorhiza)	X	X	X		X	X	X	X	X			
Perideridia gairdneri	Gairdner's yampah							X	X	X			
Perideridia parishii	Parish yampah	X	X	X		X	X	X	X	X	X	X	X
Perideridia pringlei	adobe yampah	X	X	X		X		X					
Sanicula arguta	sharp-toothed sanicle							X					
Sanicula bipinnata	poison sanicle			X				X					
Sanicula crassicaulis	Pacific sanicle		X					X					
Sanicula graveolens			X										
Sanicula maritima	adobe sanicle								X	X			
Sanicula tuberosa	tuberous sanicle, snakeroot		X					X					
Scandix pecten-veneris	shepherd's needle		X					X					

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Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Tauschia arguta	southern tauschia		X				X	X					
Tauschia hartwegii			X					X					
Tauschia parishii			X										
Torilis nodosa								X					
Yabea microcarpa	California hedge parsley		X					X					X
Asclepiadaceae	**Milkweed Family**												
Asclepias californica	California milkweed		X	X			X	X				X	
Asclepias eriocarpa	Indian milkweed	X	X	X	X	X	X	X	X	X	X	X	X
Asclepias erosa	desert milkweed	X	X	X		X	X	X	X	X	X	X	X
Asclepias fascicularis	narrow-leaf milkweed	X	X	X	X	X	X	X	X	X	X	X	X
Asclepias vestita	woolly milkweed	X	X		X	X	X	X	X	X			
Cynanchum utahense	Utah vine milkweed	X	X		X								
Matelea parvifolia	spearleaf	X	X		X								
Sarcostemma cynanchoides	climbing milkweed	X	X		X								
Asteraceae	**Sunflower Family**												
Acamptopappus sphaerocephalus	goldenhead	X	X		X	X	X		X	X	X	X	
Achillea millefolium	California yarrow	X	X	X		X	X	X	X	X	X	X	X
Achyrachaena mollis	blow-wives	X	X	X		X	X	X	X	X	X	X	X
Acourtia microcephala	sacapellote	X	X	X		X	X	X	X	X	X	X	X

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	Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
*	*Acroptilon repens*	Russian knapweed	X	X	X		X	X	X	X	X	X	X	X
*	*Ageratina adenophora*	eupatory			X			X	X	X	X	X	X	X
	Agoseris grandiflora	mountain dandelion	X	X	X		X	X	X	X	X	X	X	X
	Agoseris heterophylla	agoseris	X	X	X		X	X	X	X	X	X	X	X
	Agoseris retrorsa	spear-leaved agoseris	X	X	X		X	X	X	X	X	X	X	X
	*Amblyopappus pusill*us								X					X
	Ambrosia acanthicarpa	annual bur-sage	X	X	X	X	X	X	X	X	X	X	X	X
	Ambrosia chamissonis	beach bur							X					X
	Ambrosia conifertiflora							X	X	X	X	X	X	
	Ambrosia dumosa	burro-bush	X	X		X								
	Ambrosia psilostachya	western ragweed (sandbur)	X	X	X	X	X	X	X	X	X	X	X	X
*	*Ancistrocarphus filagineus*		X	X	X	X	X	X		X	X	X	X	
	Anisocoma acaulis	scalebud	X	X		X				X	X	X	X	
	Antennaria marginata	white-margined everlasting								X	X			
*	*Anthemis cotula*	mayweed	X	X	X		X	X	X	X	X	X	X	X
*	*Artemisia biennis*	biennial sagewort	X	X	X		X	X	X	X	X	X	X	
	Artemisia californica	California sagebrush	X	X	X		X	X	X	X	X	X	X	X
	Artemisia douglasiana	mugwort	X	X	X		X	X	X	X	X	X	X	X
	Artemisia dracunculus	tarragon	X	X	X		X	X	X	X	X	X	X	X

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	VASCULAR PLANTS–Angiosperms (Dicotyledons)		SIGNIFICANT ECOLOGICAL AREAS											
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	Artemisia palmeri	Palmer sagewort							X	X	X	X	X	
	Artemisia spinescens	budsage	X	X		X								
	Artemisia tridentata	basin sagebrush	X	X					X	X	X	X	X	
	Aster frondosus		X	X	X		X	X	X	X	X	X	X	
	Aster greatae	Greata's aster	X	X	X			X		X	X			
	Aster lanceolatus hesperus	aster							X	X	X	X	X	
	Aster subulatus	broom aster	X	X	X		X	X	X	X	X	X	X	X
	Baccharis douglasii	marsh baccharis							X	X	X	X	X	
	Baccharis emoryi	Emory baccharis	X	X	X		X	X	X	X	X	X	X	
	Baccharis pilularis	coyote brush						X	X			X	X	X
	Baccharis plummerae	Plummer's baccharis		X	X		X	X	X	X	X	X	X	X
	Baccharis salicifolia	mulefat	X	X	X		X	X	X	X	X	X	X	X
	Baccharis sarothroides	broom baccharis	X	X		X						X	X	
	Baileya pleniradiata	desert marigold	X	X		X								
	Balsamorhiza deltoidea	deltoid balsam-root		X	X		X	X	X					
*	*Bellis perennis*	English daisy	X	X	X		X	X	X	X	X	X	X	X
	Bidens frondosa	stick tight	X	X	X		X	X	X	X	X	X	X	X
	Bidens laevis	bur-marigold	X	X	X		X	X	X	X	X	X	X	X
*	*Bidens pilosa*	beggar-ticks	X	X	X		X	X	X	X	X	X	X	X

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	Brickellia californica	California brickellbush	X	X	X	X	X	X	X	X	X	X	X	X
	Brickellia desertorum	desert brickellia	X	X		X								
	Brickellia microphylla	little-leaved brickelbush	X	X	X		X	X	X	X	X	X		
	Brickellia nevinii	Nevin's brickellbush	X	X	X	X	X	X	X	X	X	X		
	Calycadenia villosa	dwarf calycadenia							X	X	X	X	X	
	Calycoseris parryi	yellow tack stem	X	X						X	X	X	X	
*	*Carduus pycnocephalus*	Italian thistle	X	X	X		X	X	X	X	X	X	X	X
*	*Centaurea melitensis*	tocalote	X	X	X		X	X	X	X	X	X	X	X
*	*Centaurea solstitialis*	yellow star-thistle	X	X	X		X	X	X	X	X	X	X	X
*	*Chaenactis artemisiaefolia*	white pincushion										X	X	
	Chaenactis carphoclinia	pebble pincushion flower	X	X										
	Chaenactis fremontii	fremont pincushion flower	X	X		X				X	X	X	X	
	Chaenactis glabriuscula	yellow pincushion	X	X	X	X	X	X	X	X	X	X	X	X
	Chaenactis macrantha	large-flowered pincushion flower	X											
	Chaenactis parishii	Parish’s chaenaetis								X	X	X	X	
	Chaenactis santolinoides	perennial pincushion flower	X	X	X		X	X	X	X	X			
	Chaenactis stevioides	desert pincushion	X	X										
	Chaenactis xantiana		X	X	X	X	X	X	X	X	X			
	Chamomilla occidentalis	alkali pineapple weed	X						X			X	X	

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*	*Chamomilla suaveolens*	pineapple weed		X	X				X	X	X	X	X	
*	*Chrysanthemum coronarium*	garland daisy							X	X	X	X	X	
	Chrysothamnus nauseosus	rubber rabbitbrush	X	X	X	X	X	X	X	X	X	X	X	
	Chrysothamnus teretifolius		X	X	X	X	X	X	X	X	X			
*	*Cichorium intybus*	chichory	X	X	X		X	X	X	X	X	X	X	X
	Cirsium occidentale	thistle	X	X	X	X	X	X	X	X	X	X	X	X
*	*Cirsium vulgare*	bull thistle	X	X	X		X	X	X	X	X	X	X	X
*	*Cnicus benedictus*	blessed thistle	X	X	X		X		X	X	X	X	X	
*	*Conyza bonariensis*	flax-leaved horseweed	X	X	X		X	X	X	X	X	X	X	X
*	*Conyza canadensis*	horseweed	X	X	X	X	X	X	X	X	X	X	X	X
	Conyza coulteri	Coulter's horseweed	X	X	X	X	X	X	X	X	X	X	X	X
	Coreopsis bigelovii	Bigelow's coreopsis	X	X	X	X	X	X	X	X	X			
	Coreopsis californica	California coreopsis	X	X		X								
	Coreopsis calliopsidea	leafy-stemmed coreopsis	X	X	X	X	X	X	X	X	X			
	Coreopsis gigantea	sea dahlia							X	X	X	X	X	X
*	*Cotula australis*	Australian brass-buttons							X	X	X	X	X	
*	*Cotula coronopifolia*	brass-buttons							X	X	X	X	X	
*	*Cynara cardunculus*	cardoon	X	X	X		X	X	X	X	X	X	X	X
	Dicoria canscens	bugseed	X	X		X								

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Dimorphotheca sinuata	cape-marigold							X	X	X	X	X	
Eclipta prostrata	false daisy	X	X	X		X	X	X	X	X	X	X	X
Encelia actoni	Acton's encelia	X	X	X	X								
Encelia californica	California bush sunflower		X	X			X	X	X	X	X	X	X
Encelia farinosa	brittlebush										X	X	
Encelia virginensis	bush sunflower	X			X								
Ericameria cooperi		X	X		X								
Ericameria cuneata		X	X	X		X	X	X	X	X	X	X	
Ericameria ericoides	heather goldenbush							X			X	X	
Ericameria linearifolia	interior goldenbush	X	X	X	X	X	X	X					
Ericameria palmeri	Palmer's goldenbush							X	X	X		X	
Ericameria parishii	Parish's goldenbush			X			X		X	X		X	
Ericameria pinifolia	pinebush		X	X		X	X	X				X	
Erigeron breweri	San Jacinto Mountains daisy	X	X	X		X	X	X	X	X			
Erigeron foliosus	leafy fleabane	X	X	X		X	X	X	X	X	X	X	X
Erigeron uncialis uncialis	limestone daisy		X						X	X			
Eriogonum giganteum	San Clemente Island buckwheat												X
Eriophyllum confertiflorum	golden yarrow	X	X	X		X	X	X	X	X	X	X	X
Eriophyllum lanatum halli	Fort Tejon woolly sunflower	X	X	X	X	X	X	X	X	X	X	X	X

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	Eriophyllum mohavense	Barstow woolly sunflower	X	X										
	Eriophyllum nevinii	Nevin's woolly sunflower												X
	Eriophyllum pringlei		X	X	X	X	X	X	X	X	X			
	Eriophyllum wallacei		X	X	X	X	X	X		X	X			
	Euthamia occidentalis	western goldenrod	X	X	X		X	X	X	X	X	X	X	X
	Filago arizonica	Arizona filago							X	X	X	X	X	X
	Filago californica	California fluffweed	X	X	X		X	X	X	X	X	X	X	X
	Filago depressa		X	X					X	X	X	X	X	
*	*Filago gallica*	narrow-leaved filago	X	X	X		X	X	X	X	X	X	X	X
	Galinsoga parviflora		X	X	X		X	X	X	X	X	X	X	X
	Gnaphalium bicolor	bicolored cudweed							X	X	X	X	X	X
	Gnaphalium californicum	California everlasting	X	X	X		X	X	X	X	X	X	X	X
	Gnaphalium canescens	felty everlasting	X	X	X	X	X	X	X	X	X	X	X	X
	Gnaphalium leucocephalum								X			X	X	X
*	*Gnaphalium luteo-album*	white cudweed	X	X	X		X	X	X	X	X	X	X	X
	Gnaphalium palustre	lowland cudweed	X	X	X		X	X	X	X	X	X	X	X
	Gnaphalium ramoisissimum		X	X	X		X	X	X	X	X	X	X	X
	Gnaphalium stramineum	cotton-batting plant	X	X	X		X	X	X	X	X	X	X	X
	Grindelia camporum	gum-plant	X	X	X		X	X	X	X	X	X	X	X

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	Grindelia hirsutula	San Diego gum-plant	X	X	X		X	X	X	X	X	X	X	X
	Gutierrezia californica	California matchweed	X	X	X		X	X	X	X	X	X	X	X
	Gutierrezia microcephala	small-flowered matchweed	X	X					X	X	X	X	X	
	Gutierrezia sarothrae	broom matchweed	X	X	X	X	X	X	X	X	X	X	X	
	Hazardia cana	San Clemente Island hazardia												X
	Hazardia squarrosa	saw-toothed goldenbush	X	X	X		X	X	X	X	X	X	X	X
*	*Hedypnois cretica*	crete hedypnois							X	X	X	X	X	
	Helenium puberulum	sneezeweed		X	X		X	X	X			X	X	
	Helianthus annuus	common sunflower	X	X	X	X	X	X	X	X	X	X	X	X
	Helianthus californicus								X	X	X	X	X	
	Helianthus gracilentus	slender sunflower	X	X	X		X	X	X	X	X	X	X	X
	Helianthus nuttallii	Los Angeles sunflower	X		X			X		X	X			
	Hemizonia clementia	island tarplant												X
	Hemizonia fasciculata	fascicled tarweed	X	X	X		X	X	X	X	X	X	X	X
	Hemizonia kelloggii		X	X	X		X	X	X	X	X	X	X	X
	Hemizonia minthornii	Santa Susana tarplant						X	X					
	Hemizonia mohavensis	Mohave tarplant								X	X			
	Hemizonia paniculata	San Diego tarweed							X	X	X	X	X	
	Hemizonia parryi	southern tarweed				X								X

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*	*Hemizonia pungens*	common spikeweed	X	X	X		X	X	X	X	X	X	X	X
	Heterotheca grandiflora	telegraph weed		X										
	Heterotheca sessiliflora	hairy golden-aster	X	X	X		X	X	X	X	X	X	X	X
	Hieracium argutum		X		X			X	X	X	X	X	X	
	Holocarpha heermannii			X										
	Holocarpha virgata	graceful tarplant							X	X	X	X	X	
	Hulsea heterochroma			X								X		X
	Hulsea vestita	beautiful hulsea	X	X	X			X	X	X	X		X	
	Hymenoclea salsola	burrobrush	X	X	X	X	X	X	X	X	X	X	X	X
*	*Hypochaeris glabra*	smooth cat's-ear	X	X	X		X	X	X	X	X	X	X	X
	Hypochaeris radicata	hairy cat's-ear							X					
	Isocoma acradenius	alkali golden bush	X	X										
	Isocoma menziesii	coastal goldenbush		X	X		X	X	X	X	X	X	X	X
	Iva axillaris		X	X	X		X	X	X	X	X	X	X	X
	Jaumea carnosa	fleshy Jaumea							X					
*	*Lactuca serriola*	prickly lettuce	X	X	X		X	X	X	X	X	X	X	X
	Lagophylla ramiosissma	common hareleaf	X	X	X		X	X	X	X	X	X	X	X
	Lasthenia californica	coast goldfields	X	X	X	X	X	X	X	X	X	X	X	X
	Lasthenia coronaria		X	X					X	X	X	X	X	

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	Lasthenia glabrata	Coulter goldfields	X	X	X		X	X	X	X	X	X	X	
	Layia glandulosa	white layia	X	X	X		X	X	X	X	X	X	X	X
	Layia heterotricha	pale-yellow layia		X										
	Layia platyglossa	tidy-tips	X	X	X		X	X	X	X	X	X	X	X
	Lepidospartum squamatum	scale-broom	X	X	X		X	X	X	X	X	X	X	X
	Lessingia filaginifolia	California aster	X	X	X		X	X	X	X	X	X	X	X
*	*Leucanthemum vulgare*	ox-eye daisy		X	X		X	X	X			X	X	
	Machaeranthera asteroides	Laguna Mountains aster								X	X	X	X	
	Machaeranthera carnosa	shrubby alkali aster	X	X		X								
	Madia elegans		X	X	X		X	X	X	X	X	X	X	X
	Madia exigua	threadstem madia	X	X	X		X	X	X	X	X	X	X	X
	Madia gracilis	slender tarweed	X	X	X		X	X	X	X	X	X	X	X
	Malacothrix californica		X	X	X		X	X	X	X	X	X	X	X
	Malacothrix coulteri	snake's head	X	X	X		X	X	X			X	X	
	Malacothrix glabrata	desert dandelion	X	X										
	Malacothrix incana	dunedelion							X					
	Malacothrix saxatilis	cliff aster	X	X	X		X	X	X	X	X	X	X	X
	Malacothrix sonchoides	yellow saucers	X	X										
	Micropus californicus	slender cottonweed	X	X	X		X	X	X	X	X	X	X	X

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	Microseris douglasii	Douglas's microseris		X					X	X	X	X	X	X
	Microseris elegans								X	X	X	X	X	X
	Monolopia lanceolota		X	X	X		X	X	X	X	X	X	X	X
	Monoloptilon bellidiforme	mojave desert star	X	X		X								
	Nicolletia occidentalis	hole-in-the-sand plant	X	X		X								
	Osmadenia tenella	southern rosinweed	X	X	X		X	X	X	X	X	X	X	X
*	*Osteospermum ecklonis*	training African daisy		X	X		X	X	X					
	Pentachaeta aurea	golden daisy			X			X		X	X	X	X	
	Pentachaeta lyonii	Lyon's pentachaeta							X					X
	Perityle emoryi		X	X	X		X	X	X	X	X	X	X	X
*	*Picris echioides*	bristly ox-tongue	X	X	X		X	X	X	X	X	X	X	X
	Pluchea odorata	salt marsh fleabane	X	X	X		X	X	X	X	X	X	X	X
	Pluchea sericea	arrow weed	X	X	X		X	X	X	X	X	X	X	X
	Porophyllym gracile	odora	X	X										
	Prenanthella exigua	annual mitre	X	X		X								
	Psathrotes annua	mealy rosettes	X	X		X								
	Psilocarphus brevissimus	woolly marbles	X	X	X		X	X	X	X	X	X	X	X
	Psilocarphus tenellus	slender woolly-heads	X	X	X		X	X	X	X	X	X	X	X
*	*Pulicaria paludosa*	Spanish sunflower	X	X	X		X	X	X	X	X	X	X	X

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Rafinesquia californica	California chicory	X	X	X	X	X	X	X	X	X	X	X	X
Rafinesquia neomexicana	California chicory	X	X		X								
Rigiopappus leptocladus		X	X	X		X	X	X	X	X			
Senecio aphanactis	Rayless ragwort							X	X	X	X	X	X
Senecio breweri		X	X	X		X	X	X					
Senecio californicus	California butterweed	X	X	X		X	X	X	X	X	X	X	X
Senecio flaccidus	shrubby butterweed	X	X	X	X	X	X	X	X	X	X	X	X
Senecio ionophyllus	Tehachapi ragwort	X	X	X			X		X	X			
Senecio lyonii	island ragwort												X
* *Senecio vulgaris*	common groundsel	X	X	X		X	X	X	X	X	X	X	X
* *Silybum marianum*	milk thistle							X	X	X	X	X	X
Solidago californica	California goldenrod	X	X	X		X	X	X	X	X	X	X	X
Solidago confinis	southern goldenrod	X	X	X		X	X	X	X	X	X	X	X
* *Soliva sessilis*		X	X	X		X	X	X	X	X	X	X	X
* *Sonchus asper*	prickly sow thistle	X	X	X		X	X	X	X	X	X	X	X
* *Sonchus oleraceus*	common sow thistle	X	X	X		X	X	X	X	X	X	X	X
Stebbinsoseris heterocarpa	brown microseris							X	X	X	X	X	X
Stephanomeria cichoriacea	Tejon milk-aster							X	X	X	X	X	X
Stephanomeria diegensis		X	X	X		X	X	X	X	X	X	X	X

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VASCULAR PLANTS–Angiosperms (Dicotyledons)		SIGNIFICANT ECOLOGICAL AREAS											
Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Stephanomeria exigua	small wreathplant	X	X	X		X	X	X	X	X	X	X	X
Stephanomeria parryi	rock pink	X	X		X								
Stephanomeria pauciflora	wire-lettuce	X	X	X	X	X	X	X	X	X	X	X	
Stephanomeria virgata	twiggy wreathplant	X	X	X	X	X	X	X	X	X	X	X	X
Stylocline masonii	Mason's neststraw		X										
Stylocline micropoides	desert nest straw	X											
Stylocline psilocarphoides	peck nest straw	X	X		X								
Syntrichopappus fremontii		X	X		X								
Syntrichopappus lemmonii	Lemmon's syntrichopappus	X	X	X		X	X	X	X	X			
Tetradymia axillaris	cotton-thorn	X	X		X								
Tetradymia canescens		X	X	X	X	X	X	X	X	X	X	X	X
Tetradymia comosa	hairy horsebrush	X	X	X		X	X	X	X	X	X	X	
Tetradymia glabrata	desert horsebrush	X	X		X								
Tetradymia stenolepis	felt-thorn	X	X		X								
* *Tragopogon porrifolius*	salsify, oyster plant	X	X	X		X	X	X	X	X	X	X	X
* *Trichocoronis wrightii*	Wright's trichocoronis							X	X	X	X	X	
Uropappus lindleyi	silver puffs	X	X	X	X	X	X	X	X	X	X	X	X
Venegasia carpesioides	canyon-sunflower	X	X	X		X	X	X	X	X	X	X	X
* *Verbesina encelioides*	golden crownbeard							X	X	X	X	X	

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	Xanthium spinosum	spiny cocklebur	X	X	X		X	X	X	X	X	X	X	X
*	*Xanthium strumarium*	cocklebur	X	X	X	X	X	X	X	X	X	X	X	X
	Xylorhiza tortilfolia	mojave aster	X	X		X								
	Bataceae	**Saltwort Family**												
	Batis maritima	saltwort							X					
	Berberidaceae	**Barberry Family**												
	Berberis fremontii	Fremont barberry	X	X								X	X	
	Berberis nevinii	Nevin's barberry	X	X	X		X	X	X	X	X	X	X	X
	Berberis pinnata	Oregon grape	X	X	X		X	X	X	X	X	X	X	
	Betulaceae	**Birch Family**												
	Alnus rhombifolia	white alder	X	X	X			X	X	X	X	X	X	
	Boraginaceae	**Borage Family**												
	Amsinckia menziesii	fiddleneck	X	X	X		X	X	X	X	X	X	X	X
	Amsinckia tessellata		X	X	X		X	X						
	Cryptantha angustifolia	caterpillar forget-me-not	X	X		X								
	Cryptantha circumscissa		X	X	X	X	X	X	X	X	X	X	X	X
	Cryptantha clevlandii								X	X	X	X	X	X
	Cryptantha decipiens		X	X	X		X	X	X					
	Cryptantha dumetorum	twining cryptantha	X	X	X									

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Cryptantha holoptera	winged cryptantha	X	X		X								
Cryptantha intermedia	common forget-me-not	X	X	X		X	X	X	X	X	X	X	X
Cryptantha maritima		X	X	X	X	X	X	X	X	X	X	X	X
Cryptantha micrantha		X	X				X						
Cryptantha micromeres	minute-flowered cryptantha	X	X	X	X	X	X	X	X	X	X	X	X
Cryptantha microstachys	ribbed cryptantha		X				X	X					
Cryptantha muricata	prickly cryptantha	X	X	X	X	X	X	X	X	X	X	X	X
Cryptantha nevadensis		X	X				X						
Cryptantha oxygona		X	X	X	X	X	X	X	X	X	X	X	X
Cryptantha pterocarya			X										
Cryptantha simulanus			X										
Harpagonella palmeri	Palmer's grappling hook		X										X
Heliotropum curassavicum	saltmarsh heliotrope	X	X	X	X	X	X	X	X	X	X	X	X
Pectocarya heterocarpa	odd fruited combbur	X											
Pectocarya linearis	slender pectocarya	X	X	X	X	X	X	X	X	X	X	X	X
Pectocarya penicillata	winged pectocarya	X	X	X	X	X	X	X	X	X	X	X	X
Pectocarya platycarpa	broad-margined combbur	X	X		X								
Pectocarya recurvata		X	X		X								
Pectocarya setosa		X	X	X	X	X	X	X	X	X	X	X	X

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Plagiobothrys acanthocarpus	adobe allocarya							X					
Plagiobothrys arizonicus		X	X	X		X	X		X	X			
Plagiobothrys bracteatus	vernal pool popcornflower	X	X	X		X	X	X	X	X	X	X	X
Plagiobothrys canescens		X	X	X	X	X	X	X	X	X	X	X	X
Plagiobothrys collinus	California popcornflower	X	X	X	X	X	X	X	X	X	X	X	X
Plagiobothrys jonesii		X	X		X								
Plagiobothrys nothofulvus	popcornflower	X	X	X	X	X	X	X	X	X	X	X	X
Tiquila nuttalliana	annual coldenia	X	X										
Tiquila plicata	plaited coldenia	X	X										
Brassicaceae	**Mustard Family**												
Arabis glabra	tower mustard	X	X	X	X	X	X	X	X	X	X	X	X
Arabis pulchra		X	X										
Arabis shockleyi	Shockley's rock cress	X	X										
Arabis sparsiflora		X	X	X	X	X	X	X	X	X	X	X	X
Athysanus pusillus	dwarf athysanus	X	X	X	X	X	X	X	X	X	X	X	X
Barbarea orthroceras	winter-cress	X	X	X	X	X	X	X	X	X	X	X	X
* *Brassica nigra*	black mustard	X	X	X	X	X	X	X	X	X	X	X	X
* *Brassica rapa*	field mustard	X	X	X	X	X	X	X	X	X	X	X	X
Brassica tournefortii	Sahara mustard	X	X	X	X	X	X	X	X	X	X	X	X

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	Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
	Cakile maritima	sea-rocket							X					
*	*Capsella bursa-pastoris*	shepherd's purse	X	X	X	X	X	X	X	X	X	X	X	X
	Cardamine californica	milk maids	X	X	X	X	X	X	X	X	X	X	X	X
	*Cardamine ogliosperm*a		X	X	X		X	X	X	X	X	X	X	X
*	*Cardaria chalepensis*	lens-podded hoary cress	X	X	X		X	X	X	X	X	X	X	X
	Cardaria draba	heart-podded hoary cress	X	X	X		X	X	X	X	X	X	X	X
*	*Cardaria pubescens*	white-top	X	X	X	X	X	X	X	X	X	X	X	X
	Caulanthus amplexicaulis	Santa Barbara jewelflower		X	X			X	X	X	X			
	Caulanthus cooperi		X	X	X	X								
	Caulanthus heterophyllus	San Diego jewelflower	X	X	X		X	X	X	X	X	X	X	X
	*Caulanthus inflatu*s	desert candle	X	X										
	Coronopus didymus	wart cress	X	X	X	X	X	X	X	X	X	X	X	X
	Descurainia pinnata		X	X	X		X	X	X	X	X	X	X	X
*	*Descurainia sophia*		X	X	X	X	X	X	X	X	X	X	X	X
	Dithyrea californica	spectacle-pod	X	X		X								
	Dithyrea maritima	beach spectaclepod							X					X
	Draba cuneifolia		X	X	X	X	X	X	X	X	X	X	X	X
	Draba verna		X	X	X	X	X	X	X	X	X	X	X	X
	Erysimum capitatum	western wallflower	X	X	X	X	X	X	X	X	X	X	X	X

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	Erysimum insulare	wallflower							X					
	Guillenia lasiophylla	California mustard	X	X	X	X	X	X	X	X	X	X	X	X
*	*Hirshfeldia incana*	short-podded mustard							X	X	X	X	X	
	Hutchinsia procumbens	hutchinsia	X	X	X		X	X	X	X	X	X	X	X
	Lepidium flavum	yellow pepper-grass	X	X		X								
	Lepidium fremontii	desert alyssum	X	X		X								
	Lepidium lasiocarpum	peppergrass	X	X	X	X	X	X	X	X	X	X	X	X
	Lepidium latifolium	peppergrass							X					X
	Lepidium latipes	dwarf peppergrass							X	X	X	X	X	
	Lepidium nitidum	shining peppergrass	X	X	X	X	X	X	X	X	X	X	X	X
	Lepidium oblongum		X	X	X		X	X	X	X	X	X	X	X
	Lepidium perfoliatum	shield-cress	X	X		X								
	Lepidium virginicum		X	X	X	X	X	X	X	X	X	X	X	X
	Lesquerella kingii	San Bernardino Mountains bladderpod		X						X	X			
*	*Lobularia maritima*	sweet-alyssum							X	X	X	X	X	
*	*Matthiola incana*								X					
*	*Raphanus raphanistrum*	jointed charlock	X	X	X	X	X	X	X	X	X	X	X	X
*	*Raphanus sativus*	radish	X	X	X	X	X	X	X	X	X	X	X	X
	Rorippa curvisiliqua		X	X	X			X	X	X	X	X	X	X

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	Rorippa gambellii	Gambel's water cress								X	X			
	Rorippa nasturtium-aquaticum	water-cress							X	X	X	X	X	
	Rorippa palustris	Pacific yellow cress	X	X	X			X	X	X	X	X	X	X
	Sibara filifolia	Santa Cruz Island rock cress												X
*	*Sinapsis arvensis*	charlock	X	X	X	X	X	X	X	X	X	X	X	X
*	*Sisymbrium altissimum*	tumble mustard	X	X	X	X	X	X	X	X	X	X	X	X
*	*Sisymbrium irio*	London rocket	X	X	X	X	X	X	X	X	X	X	X	X
*	*Sisymbrium officinale*	hedge mustard	X	X	X	X	X	X	X	X	X	X	X	X
*	*Sisymbrium orientale*	Oriental mustard	X	X	X	X	X	X	X	X	X	X	X	X
	Stanleya pinnata	prince's plume	X	X	X	X	X	X	X	X	X			
	Streptanthella longirostris	little twist flower	X	X		X								
	Streptanthus bernardinus	Laguna Mountains jewelflower	X	X						X	X			
	Streptanthus campestris	southern jewelflower	X	X						X	X			
	Thysanocarpus curvipes		X	X	X		X	X	X	X	X	X	X	X
	Thysanocarpus laciniatus	narrow-leaved fringe pod	X	X	X	X	X	X	X	X	X	X	X	X
	Tropidocarpum gracile	slender dobie-pod	X	X	X	X	X	X	X	X	X	X	X	X
	Cactaceae	**Cactus Family**												
	Bergerocactus emoryi	golden-spined cereus												X
	Echinocactus polycephalus	cotton top cactus	X											

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	Escobaria vivipara	foxtail cactus	X	X		X								
	Opuntia acanthocarpa	buckhorn cholla	X	X		X								
	Opuntia basilaris	beavertail cactus	X	X	X	X		X		X	X			
	Opuntia echinocarpa	silver or golden cholla	X	X		X								
*	*Opuntia ficus-indica*	Indian fig							X				X	X
	Opuntia littoralis	coastal prickly pear							X	X	X	X	X	X
	Opuntia ×occidentalis	western pricklypear							X	X	X	X	X	X
	Opuntia oricola	pancake prickly pear		X	X			X	X	X	X	X	X	X
	Opuntia parryi	cane cholla	X	X	X		X	X	X	X	X	X	X	
	Opuntia prolifera	cholla		X	X		X	X	X	X	X	X	X	X
	Opuntia ramoisissima	diamond cholla	X	X		X								
	Opuntia ×vaseyi	mesa prickly pear							X	X	X	X	X	
	Callitrichaceae	**Water Starwort Family**												
	Callitriche marginata	California water-starwort	X	X	X		X	X	X	X	X	X	X	X
	Campanulaceae	**Bellflower Family**												
	Githopsis diffusa	bluecup	X	X	X		X	X	X	X	X			
	Lobelia dunnii							X	X	X	X			
	Nemacladus glanduliferus	thread-stem	X	X										
	Nemacladus gracilis	slender nemacladus	X	X	X									

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	Nemacladus ramossisima	Nuttall's nemacladus	X	X	X		X	X	X	X	X	X	X	
	Nemacladus sigmoideus		X	X		X								
	Triodanis biflora		X	X	X	X	X	X	X	X	X	X	X	X
	Capparaceae	**Caper Family**												
	Cleomella obtusifolia	Mohave stinkweed	X	X		X								
	Isomeris arborea	bladderpod	X	X	X	X	X	X	X	X	X	X	X	X
	Wislizenia refracta	jackass-clover	X	X		X								
	Caprifoliaceae	**Honeysuckle Family**												
	Lonicera hispidula	wild honeysuckle	X	X	X		X	X	X	X	X	X	X	X
	Lonicera interrupta	chaparral honeysuckle	X	X	X		X	X	X	X	X	X	X	X
	Lonicera subspicata	southern honeysuckle	X	X	X		X	X	X	X	X	X	X	X
	Sambucus mexicana	Mexican elderberry	X	X	X		X	X	X	X	X	X	X	X
	Symphoricarpos albus	snowberry	X	X	X			X	X	X	X	X	X	X
	Symphoricarpos mollis	creeping snowberry	X	X	X			X	X	X	X	X	X	X
	Caryophyllaceae	**Pink Family**												
	Arenaria macradenia	desert sandwort		X						X	X			
	Cardionema ramosissimum	sand mat							X					
*	*Cerastium glomeratum*	mouse-ear chickweed	X	X	X		X	X	X	X	X	X	X	X
*	*Herniaria hirsuta*								X			X	X	

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	Loeflingia squarrosa	California loeflingia	X			X			X	X	X	X	X	
	Minuartia douglasii	Douglas's sandwort	X	X	X		X	X	X	X	X	X	X	X
	Polycarpon depressum								X			X	X	
*	*Polycarpon tetraphyllum*	four-leaved allseed	X		X				X	X	X	X	X	
	Silene antirrhina		X	X	X	X	X	X	X	X	X	X	X	X
	Silene californica			X	X		X	X	X					
*	*Silene gallica*	common catchfly	X	X	X		X	X	X	X	X	X	X	X
	Silene laciniata	fringed Indian pink	X	X	X		X	X	X	X	X	X	X	X
	Silene lemmonii		X	X	X		X	X	X	X	X	X	X	X
	Silene multinervia	many-nerved catchfly	X	X	X		X	X	X	X	X	X	X	X
	Silene verecunda		X	X	X		X	X	X	X	X	X	X	
*	*Spergula arvensis*	stickwort							X	X	X	X	X	
	Spergularia atrosperma	mat sand-spurrey										X	X	
*	*Spergularia bocconii*	Boccone's sandspurrey							X	X	X	X	X	X
	Spergularia macrotheca	alkali spurrey	X	X		X			X	X	X	X	X	X
	Spergularia marina	saltmarsh sandspurrey	X	X		X			X	X	X	X	X	X
*	*Spergularia villosa*	villous sand-spurrey												X
*	*Stellaria media*	common chickweed							X	X	X	X	X	X
	Stellaria nitens	shining chickweed	X	X	X		X	X	X	X	X	X	X	X

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	Chenopodiaceae	**Goosefoot Family**												
	Allenrolfea occidentalis	iodine bush	X	X										
	Aphanisma blitoides	aphanisma							X					X
	Atriplex argentea	silverscale	X	X								X	X	
	Atriplex californica	California saltbush							X					X
	Atriplex canescens	fourwing saltbush	X	X	X	X	X	X	X	X	X	X	X	
	Atriplex confertifolia	shadscale	X	X										
	Atriplex coronata	crownscale							X			X	X	
	Atriplex coulteri	Coulter’s saltbush							X					X
	Atriplex hymenelytra	desert holly	X	X		X								
*	*Atriplex lentiformis*	big saltbush	X	X	X	X	X	X	X	X	X	X	X	
	Atriplex leucophylla								X					X
	Atriplex pacifica	south coast saltbush							X					X
	Atriplex parishii	Parish’s brittlescale							X					
	Atriplex parryi	Parry's saltbush	X	X										
	Atriplex phyllostegia	arrowscale	X	X		X								
	Atriplex polycarpa		X	X										
*	*Atriplex rosea*	tumbling oracle	X	X	X	X	X	X	X	X	X	X	X	X
*	*Atriplex semibaccata*	Australian saltbush	X	X	X	X	X	X	X	X	X	X	X	X

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	Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
	Atriplex serenana	bractscale	X	X					X					
	Atriplex spinifera	spinescale	X	X										
	Atriplex triangularis	spearscale							X					X
	Atriplex watsonii								X					X
*	*Bassia hyssopifolia*	five-hooked bassia	X	X	X	X	X	X	X	X	X	X	X	X
*	*Beta vulgaris*	beet							X			X	X	X
*	*Chenopodium album*	lamb's quarters	X	X	X	X	X	X	X	X	X	X	X	X
*	*Chenopodium ambrosioides*	Mexican tea	X	X	X		X	X	X	X	X	X	X	X
	Chenopodium berlandieri	pitseed goosefoot	X	X	X	X	X	X	X	X	X	X	X	X
*	*Chenopodium botrys*	Jerusalem oak	X	X	X	X	X	X	X	X	X	X	X	X
	Chenopodium californicum	California goosefoot	X	X	X	X	X	X	X	X	X	X	X	X
	Chenopodium fremontii		X	X				X	X					
	Chenopodium incognitum		X	X				X	X					
*	*Chenopodium macrospermum*	goosefoot							X					
*	*Chenopodium multifidum*	cut-leaved goosefoot							X				X	
*	*Chenopodium murale*	nettle-leaved goosefoot	X	X	X	X	X	X	X	X	X	X	X	X
	Chenopodium pratericola			X	X		X	X	X					
*	*Chenopodium pumilio*		X	X	X		X	X	X	X	X	X	X	
*	*Chenopodium rubrum*			X					X					

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*	*Chenopodium strictum*								X			X	X	
	Grayia spinosa			X				X	X					
*	*Halogeton glomeratus*	halogeton	X	X		X								
	Kochia californica	Mojave red sage	X	X										
*	*Kochia scoparia*	kochia	X	X		X			X			X	X	
	Krascheninnikovia lanata		X	X				X	X					
	Monolepis nuttalliana	patata	X	X	X	X	X	X	X	X	X	X	X	X
	Nitrophila occidentalis	alkali weed	X	X					X			X	X	
	Salicornia bigevolii								X					
	Salicornia europaea			X					X					
	Salicornia subterminalis		X	X					X					X
	Salicornia virginica	common pickleweed							X					X
*	*Salsola tragus*	Russian thistle	X	X	X	X	X	X	X	X	X	X	X	X
	Sarcobatus vermiculatus	greasewood	X	X		X								
	Suaeda calceoliformis	horned sea-blite	X	X	X		X		X			X	X	
	Suaeda californica	California sea-blite							X					
	Suaeda esteroa	estuary seablite							X					
	Suaeda moquinii	bush seepweed	X	X	X	X	X	X	X	X	X	X	X	X
	Suaeda taxifolia	woolly sea-blite							X					X

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	Cistaceae	**Rock-Rose Family**												
*	*Cistus ladanifer*	gum cistus		X						X	X			
	Helianthemum greenei	island rush-rose												X
	Helianthemum scoparium	peak rush-rose		X				X						
	Convolvulaceae	**Morning-Glory Family**												
	Calystegia longipes		X	X		X								
	Calystegia macrostegia	chaparral morning glory							X	X	X	X	X	X
	Calystegia malacophylla			X	X		X	X	X					
	Calystegia occidentalis		X	X	X		X	X	X	X	X	X	X	X
	Calystegia peirsonii	Peirson's morning glory	X	X	X									
	Calystegia purpurata								X					
	Calystegia soldanella	Beach morning glory							X					
*	*Convolvulus arvensis*	bindweed	X	X	X			X	X	X	X	X	X	
	Convolvulus simulans	small-flowered morning glory	X	X	X		X	X	X	X	X	X	X	X
	Cressa truxillensis	alkali weed	X	X	X	X	X	X	X	X	X	X	X	X
	Dichondra occidentalis	western dichondra							X			X	X	X
*	*Ipomoea purpurea*	common morning-glory	X	X	X		X	X	X	X	X	X	X	X
	Cornaceae	**Dogwood Family**												
	Cornus glabrata	brown dogwood	X	X	X		X	X	X	X	X	X	X	X

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Crassulaceae	**Stonecrop Family**												
Crassula aquatica	vernal pool pygmy-weed	X	X	X		X		X			X	X	X
Crassula connata	pygmy-weed	X	X	X		X	X	X	X	X	X	X	X
Dudleya abramsii	conejo dudleya	X	X	X			X	X	X	X	X	X	X
Dudleya blochmaniae								X					
Dudleya caespitosa								X					
Dudleya cymosa		X	X	X			X	X	X	X	X	X	
Dudleya densiflora	San Gabriel Mountains dudleya	X		X					X	X			
Dudleya edulis								X			X	X	
Dudleya greenei	Greene's dudleya							X					
Dudleya hassei	Catalina Island dudleya												X
Dudleya lanceolata	lance-leaved dudleya	X	X	X			X	X	X	X	X	X	
Dudleya multicaulis	many stemmed dudleya						X	X	X	X	X	X	
Dudleya pulverulenta	chalk dudleya	X	X	X		X	X	X	X	X	X	X	
Dudleya saxosa	panamint dudleya										X	X	
Dudleya verityi	Verity's dudleya							X					
Dudleya virens	bright green dudleya							X					X
Sedum spathulifolium		X	X				X	X	X	X			

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Crossomataceae	**Crossosoma Family**												
Crossosoma californicum	Catalina crossosoma												X
Cucurbitaceae	**Gourd Family**												
Cucurbita foetidissima	calabazilla	X	X	X	X	X	X	X	X	X	X	X	X
Cucurbita palmata	coyote melon	X	X	X	X	X	X	X	X	X	X	X	X
Marah fabaceus	California man-root	X	X	X		X	X	X	X	X	X	X	X
Marah horridus			X										
Marah macrocarpus	wild cucumber	X	X	X		X	X	X	X	X	X	X	X
Cuscutaceae	**Dodder Family**												
Cuscuta californica	California dodder	X	X	X		X	X	X	X	X	X	X	X
Cuscuta pentagona								X	X	X	X	X	
Cuscuta salina								X					
Datiscaceae	**Datisca Family**												
Datisca glomerata	durango root	X	X	X		X	X	X	X	X	X	X	X
Elatinaceae	**Waterwort Family**												
Elatine brachysperma	yerba fango	X	X	X	X	X	X	X	X	X	X	X	X
Elatine chilensis											X	X	
Ericaceae	**Heath Family**												
Arctostaphylos catalinae	Santa Catalina Island manzanita												X

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	Arctostaphylos gabrielensis	San Gabriel manzanita	X		X					X	X			
	Arctostaphylos glandulosa	Eastwood's manzanita	X	X	X		X	X	X	X	X	X	X	X
	Arctostaphylos glauca	bigberry manzanita	X	X	X		X	X	X	X	X	X	X	
	Arctostaphylos parryana		X	X	X		X	X		X	X			
	Comarostaphylis diversifolia	summer holly							X					
	Xylococcus bicolor	mission manzanita							X	X	X	X	X	X
	Euphorbiaceae	**Spurge Family**												
	Chamaesyce albomarginata	rattlesnake weed	X	X	X	X	X	X	X	X	X	X	X	X
*	*Chamaesyce maculata*	spotted spurge	X	X	X		X	X	X	X	X	X	X	X
	Chamaesyce melanadenia	squaw spurge	X	X	X		X	X	X	X	X	X	X	X
	Chamaesyce micromeria	sonoran sandmat	X	X		X								
	Chamaesyce ocellata	yellow sandmat	X	X	X	X	X	X	X	X	X	X	X	X
	Chamaesyce polycarpa	golondrina	X	X	X	X	X	X	X	X	X	X	X	X
	Chamaesyce serpyllifolia	thyme-leafed spurge	X	X	X	X	X	X	X	X	X	X	X	X
	Croton californicus	California croton	X	X		X			X	X	X	X	X	
	Ditaxis californica	California ditaxis	X	X		X								
	Eremocarpus setigerus	dove weed	X	X	X	X	X	X	X	X	X	X	X	X
	Euphorbia crenulata	Chinese caps	X	X	X		X	X	X	X	X	X	X	X
	Euphorbia misera	cliff spurge							X					X

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*	*Euphorbia peplus*	petty spurge	X	X	X		X	X	X	X	X	X	X	X
	Euphorbia spathulata	reticulate-seeded spurge	X	X	X		X	X	X	X	X	X	X	X
*	*Ricinus communis*	castor bean			X			X	X	X	X	X	X	
	Stillingia linearifolia	linear-leaved stillingia	X	X	X	X	X	X	X	X	X	X	X	X
	Stillingia paucidentata	toothleaf	X	X		X								
	Fabaceae	**Legume Family**												
	Amorpha californica	California false indigo	X	X	X		X	X	X	X	X			
	Amorpha fruticosa	western false indigo							X			X	X	
	Astragalus acutirostris	keel beak	X	X		X								
	Astragalus bicristatus	crested milkvetch	X		X					X	X			
	Astragalus brauntonii	Braunton's milkvetch							X	X	X	X	X	
	Astragalus didymocarpus	two-seeded milkvetch	X	X	X	X	X	X	X	X	X	X	X	X
	Astragalus douglasii	Jacumba milkvetch	X	X	X		X	X	X	X	X	X	X	X
	Astragalus gambelianus	Gambell's dwarf locoweed	X	X	X		X	X	X	X	X	X	X	X
	Astragalus layneae	layne milkvetch	X	X		X								
	Astragalus lentiginosus	freckled milkvetch	X	X	X	X	X	X	X	X	X	X	X	X
	Astragalus leucolobus	Bear Valley woollypod								X	X			
	Astragalus pachypus	Jaeger's milkvetch	X	X	X	X	X	X	X	X	X	X	X	X
	Astragalus pomonensis	Pomona rattleweed							X	X	X	X	X	

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	Astragalus tener	coastal dunes milkvetch							X					
	Astragalus trichopodus	Santa Barbara locoweed	X	X	X		X	X	X	X	X	X	X	X
	Astragulus preussi	Lancaster milkvetch	X	X		X								
	Astragulus purshii		X	X		X								
	Astragulus pycnostachyus	Ventura marsh milkvetch							X					
	Glycyrrhiza lepidota	wild licorice	X	X	X	X	X	X	X	X	X	X	X	X
	Hoita macrostachya	leather root	X	X	X		X	X	X	X	X	X	X	X
	Hoita orbicularis	round-leaved psoralea	X	X	X		X	X	X	X	X	X	X	X
*	*Lathyrus latifolius*	perennial sweet pea	X	X	X		X	X	X	X	X	X	X	X
	Lathyrus splendens	pride of California							X			X	X	
	Lathyrus vestitus		X	X	X		X	X	X	X	X	X	X	X
	Lotus argophyllus		X		X		X	X	X	X	X	X	X	X
*	*Lotus corniculatus*	birdfoot trefoil	X	X	X		X	X	X	X	X	X	X	X
	Lotus crassifolius		X	X	X		X	X	X	X	X	X	X	
	Lotus dendroideus	island broom												X
	Lotus grandiflorus	large-flowered lotus	X	X	X		X	X	X	X	X	X	X	
	Lotus hamatus	San Diego lotus							X	X	X	X	X	X
	Lotus heermannii	woolly lotus							X	X	X	X	X	
	Lotus humistratus	hill (short podded) lotus	X	X	X	X	X	X	X	X	X	X	X	X

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Lotus micranthus								X	X	X	X	X	
Lotus oblongifolius		X	X	X	X	X	X	X	X	X	X	X	X
Lotus procumbens	low silver lotus	X	X	X	X	X	X	X	X	X	X	X	
Lotus purshianus	Spanish clover	X	X	X	X	X	X	X	X	X	X	X	X
Lotus salsuginosus	coastal lotus	X	X	X	X	X	X	X	X	X	X	X	
Lotus scoparius	deerweed	X	X	X		X	X	X	X	X	X	X	X
Lotus strigosus	strigose lotus	X	X	X	X	X	X	X	X	X	X	X	X
Lotus wrangelianus		X	X	X		X	X	X	X	X	X	X	X
Lupinus albifrons		X	X	X		X	X	X	X	X	X	X	X
Lupinus andersonii			X	X		X	X						
Lupinus benthamii	spider lupine		X										
Lupinus bicolor	miniature lupine	X	X	X		X	X	X	X	X	X	X	X
Lupinus chamissonis								X					
Lupinus concinnus	bajada lupine	X	X	X	X	X	X	X	X	X	X	X	X
Lupinus excubitus	grape soda lupine	X	X	X	X	X	X	X	X	X	X	X	X
Lupinus formosus	summer lupine	X	X	X		X	X	X	X	X	X	X	X
Lupinus hirsutissimus	stinging lupine	X	X	X		X	X	X	X	X	X	X	X
Lupinus latifolius	broad-leaved lupine	X	X	X	X	X	X	X	X	X	X	X	X
Lupinus longifolius	Watson's bush lupine	X	X	X		X	X	X	X	X	X	X	X

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	Lupinus microcarpus	chick lupine	X	X	X	X	X	X	X	X	X	X	X	X
	Lupinus nanus		X	X	X		X	X	X	X	X	X	X	X
	Lupinus odoratus	Mojave lupine	X	X		X								
	Lupinus peirsonii	Peirson's lupine	X		X			X		X	X			
	Lupinus shockleyi	desert lupine	X	X		X								
	Lupinus sparsiflorus	Coulter's lupine	X	X	X	X	X	X	X	X	X	X	X	X
	Lupinus succulentus	arroyo lupine	X	X	X		X	X	X	X	X	X	X	X
	Lupinus truncatus	collar lupine	X	X	X		X	X	X	X	X	X	X	X
*	*Medicago lupulina*	black medick	X	X	X		X	X	X	X	X	X	X	X
*	*Medicago orbicularis*	bur clover	X	X	X		X	X	X	X	X	X	X	X
*	*Medicago polymorpha*	California burclover	X	X	X		X	X	X	X	X	X	X	X
*	*Medicago sativa*	alfalfa	X	X	X		X	X	X	X	X	X	X	X
*	*Melilotus alba*	white sweetclover	X	X	X		X	X	X	X	X	X	X	X
*	*Melilotus indica*	sourclover	X	X	X		X	X	X	X	X	X	X	X
*	*Melilotus officinalis*	yellow sweet clover	X	X	X		X	X	X	X	X	X	X	X
*	*Parkinsonia aculeata*	Mexican palo verde	X	X	X		X	X	X	X	X	X	X	X
	Pickeringia montana	chaparral pea	X	X	X		X	X	X	X	X	X	X	X
	Prosopis glandulosa	mesquite	X	X		X								
	Psorothamnus arborescens	indigo bush	X	X		X								

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VASCULAR PLANTS–Angiosperms (Dicotyledons)			SIGNIFICANT ECOLOGICAL AREAS											
	Scientific Name	Common Name	AV	SA	SC	JT	CM	SS	SM	SG	SD	ES	PH	CI
	Rupertia physodes								X	X	X	X	X	
	Rupertia rigida	Parish's psoralea								X	X	X	X	
	Thermopsis macrophylla	Santa Ynez false lupine	X	X	X		X	X	X	X	X	X	X	X
	Trifolium albopurpureum		X	X	X		X	X	X	X	X	X	X	X
	Trifolium ciliolatum	tree clover	X	X	X		X	X	X	X	X	X	X	X
	Trifolium depauperatum	bladder clover	X	X					X	X	X	X	X	X
	Trifolium fucatum	bull clover							X	X	X	X	X	X
	Trifolium gracilentum	pinpoint clover	X	X	X		X	X	X	X	X	X	X	X
*	*Trifolium hirtum*	rose clover	X	X	X		X	X	X	X	X	X	X	X
	Trifolium incarnatum	crimson clover	X	X	X		X	X	X	X	X	X	X	X
	Trifolium microcephalum	small-headed clover							X	X	X	X	X	X
	Trifolium obtusiflorum	creek clover	X		X			X	X	X	X	X	X	
	Trifolium variegatum	white tip clover	X	X	X		X	X	X	X	X	X	X	X
	Trifolium willdenovii	tomcat clover	X	X	X		X	X	X	X	X	X	X	X
	Trifolium wormskioldii	cow clover							X	X	X	X	X	
	Vicia americana	American vetch	X	X	X		X	X	X	X	X	X	X	X
	Vicia hassei		X	X	X		X	X	X	X	X	X	X	X
	Vicia ludoviciana								X	X	X	X	X	X
*	*Vicia villosa*	hairy vetch	X	X	X		X	X	X	X	X	X	X	X

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Fagaceae	**Oak Family**												
Quercus agrifolia	coast live oak	X	X	X		X	X	X	X	X	X	X	X
Quercus berberidifolia	scrub oak	X	X	X		X	X	X	X	X	X	X	X
Quercus chrysolepis	canyon oak	X	X	X		X	X	X	X	X	X	X	X
Quercus douglasii	blue oak	X	X	X		X	X	X	X	X			X
Quercus dumosa	coastal scrub oak						X	X	X	X	X	X	X
Quercus engelmannii	Engelmann oak	X		X		X		X	X	X	X	X	X
Quercus garryana		X	X	X		X	X	X	X	X			X
Quercus john-tuckeri	Tucker's oak	X	X	X		X	X	X	X	X	X		X
Quercus kelloggii	California black oak	X	X	X		X	X						
Quercus lobata	valley oak	X	X	X		X	X	X	X	X	X	X	X
Quercus macdonaldii	MacDonald's oak												X
Quercus tomentella	island oak												X
Quercus wislizenii	interior live oak	X	X	X		X	X	X	X	X	X	X	
Frankeniaceae	**Frankenia Family**												
Frankenia palmeri	Palmer's frankenia							X	X	X	X	X	
Frankenia salina	alkali heath	X	X		X			X	X	X	X	X	X
Garryaceae	**Silk Tassel Family**												
Garrya flavescens		X	X	X		X	X	X	X	X	X	X	X

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	Garrya veatchii		X	X	X		X	X	X	X	X	X	X	X
	Gentianaceae	**Gentian Family**												
	Centaurium exaltatum		X	X	X	X				X	X	X	X	X
	Centaurium venustum	canchalagua	X	X	X	X	X	X	X	X	X	X	X	X
	Eustoma exaltatum	alkali chalice							X	X	X	X	X	
	Swertia neglecta	pine green-gentian	X	X	X		X	X	X	X	X			X
	Geraniaceae	**Geranium Family**												
*	*Erodium botrys*	broad-lobed filaree	X	X	X		X	X	X	X	X	X	X	X
*	*Erodium brachycarpum*	long-beaked filaree	X	X	X		X	X	X	X	X	X	X	X
*	*Erodium cicutarium*	red-stemmed filaree	X	X	X	X	X	X	X	X	X	X	X	X
	Erodium macrophyllum			X					X	X	X	X	X	
*	*Erodium moschatum*	white-stemmed filaree	X	X	X		X	X	X	X	X	X	X	X
	Erodium texanum	texas filaree	X	X		X			X	X	X	X	X	X
	Geranium carolinianum	Carolina geranium	X	X	X		X	X	X	X	X	X	X	X
	Geranium molle		X	X	X		X	X	X	X	X	X	X	X
	Grossulariaceae	**Gooseberry Family**												
	Ribes aureum	golden currant	X	X	X		X	X	X	X	X	X	X	X
	Ribes californicum	hillside gooseberry	X	X	X		X	X	X	X	X	X	X	X
	Ribes canthariforme	mareno current								X	X	X	X	

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Ribes divaricatum	Douglas shrub							X	X	X	X	X	
Ribes indecorum	white flowering currant	X	X	X		X	X	X	X	X	X	X	X
Ribes malvaceum	chaparral currant	X	X	X		X	X	X	X	X	X	X	X
Ribes quercetorum		X	X	X	X	X	X	X	X	X	X	X	X
Ribes roezlii	Sierra gooseberry	X	X	X		X	X	X	X	X	X	X	X
Ribes speciosum	fuchsia-flowered gooseberry	X	X	X		X	X	X	X	X	X	X	X
Ribes viburnifolium	Santa Catalina Island currant										X	X	X
Hippocastanaceae	**Buckeye Family**												
Aesculus californica	California buckeye	X	X		X								
Hydrophyllaceae	**Waterleaf Family**												
Emmenanthe penduliflora	whispering bells	X	X	X		X	X	X	X	X	X	X	X
Eriodictyon crassifolium	thick-leaved yerba santa	X	X	X		X	X	X	X	X	X	X	X
Eriodictyon trichocalyx	hairy yerba santa	X	X	X				X	X	X	X	X	
Eucrypta chrysanthemifolia		X	X	X	X	X	X	X	X	X	X	X	X
Nama pusillumpum	small-leaved nama	X	X		X								
Nama stenocarpum	mud nama	X	X	X		X	X	X	X	X	X	X	X
Nemophila menziesii	baby blue eyes	X	X	X	X	X	X	X	X	X	X	X	X
Nemophila pedunculata		X	X	X		X	X	X	X	X	X	X	X
Phacelia bicolor	sticky yellow-throats	X	X		X								

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Phacelia brachyloba	short-lobed phacelia	X	X	X		X	X	X	X	X	X	X	
Phacelia cicutaria		X	X	X		X	X	X	X	X	X	X	X
Phacelia ciliata		X	X	X		X	X	X	X	X	X	X	
Phacelia crenulata	purple phacelia	X	X		X								
Phacelia davidsonii		X	X	X		X	X	X	X	X	X	X	
Phacelia distans	fern-leaf phacelia	X	X	X	X	X	X	X	X	X	X	X	X
Phacelia douglasii	Douglas's phacelia	X	X	X	X	X	X	X	X	X			X
Phacelia egena		X	X	X		X	X	X	X	X			X
Phacelia exilis	transverse range phacelia	X	X	X		X	X	X	X	X			X
Phacelia floridunda	many-flowered phacelia												X
Phacelia fremontii	yellow-throats	X	X	X		X	X	X	X	X	X	X	X
Phacelia grandiflora	large-flowered phacelia	X	X	X		X	X	X	X	X	X	X	X
Phacelia imbricata	imbricate phacelia	X	X	X		X	X	X	X	X	X	X	X
Phacelia longipes		X	X	X	X	X	X	X	X	X	X	X	X
Phacelia minor	wild canterbury-bell	X	X	X		X	X	X	X	X	X	X	X
Phacelia mohavensis	Mojave phacelia								X	X			
Phacelia parryi	Parry's phacelia	X	X	X		X	X	X	X	X	X	X	X
Phacelia ramosissima	branching phacelia	X	X	X		X	X	X	X	X	X	X	X
Phacelia stellaris	Brand’s phacelia	X	X	X		X	X	X	X	X	X	X	X

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	Phacelia suaveolens	Santiago peak phacelia							X	X	X	X	X	
	Phacelia tanacetifolia	tansy phacelia	X	X	X	X	X	X	X	X	X	X	X	
	Phacelia viscida	sticky phacelia	X	X	X		X	X	X	X	X	X	X	X
	Pholistoma auritum	blue fiesta flower	X	X	X		X	X	X	X	X	X	X	X
	Pholistoma memranaceum		X	X	X		X	X	X	X	X	X	X	X
	Pholistoma racemosum								X	X	X	X	X	X
	Turicula parryi	poodle-dog bush	X	X	X		X	X	X	X	X	X	X	X
	Hypericaceae	**St. John's Family**												
	Hypericum formosum	St. John's wort	X	X	X		X	X	X	X	X	X	X	X
	Juglandaceae	**Walnut Family**												
	Juglans californica	California black walnut	X	X	X		X	X	X	X	X	X	X	X
	Lamiaceae	**Mint Family**												
	Acanthomintha ilicifolia	San Diego thorn mint							X	X	X	X	X	
	Acanthomintha obovata	heart-leaved thorn mint	X	X	X		X	X	X	X	X	X	X	X
	Lepechinia cardiophylla	heart-leaved pitcher sage								X	X	X		
	Lepechinia fragrans	fragrant pitcher sage							X	X	X		X	X
	Lepechinia ganderi	Gander's pitcher sage								X	X	X	X	
*	*Marrubium vulgare*	horehound	X	X	X		X	X	X	X	X	X	X	X
	Mentha arvensis	field mint	X	X	X		X	X	X	X	X	X	X	X

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	Mentha pulegium	pennyroyal							X	X	X	X	X	
*	*Mentha spicata*	spearmint	X	X	X		X	X	X	X	X	X	X	X
*	*Mentha suaveolens*			X					X	X	X	X	X	
	Monardella brewerii		X	X	X		X	X	X	X	X	X	X	X
	Monardella cinerea	Gray monardella	X		X				X	X	X	X	X	
	Monardella exilis	desert pennyroyal	X	X		X								
	Monardella hypoleuca		X	X	X		X	X	X	X	X	X	X	X
	Monardella lanceolata	mustang mint	X	X	X		X	X	X	X	X	X	X	X
	Monardella linoides	flax-like monardella								X	X			
	Monardella macrantha	Hall's monardella	X	X	X		X	X	X	X	X	X	X	X
	Monardella nana	San Felipe monardella								X	X	X	X	
	Monardella viridis	rock monardella	X							X	X		X	
	Pogogyne abramsii	San Diego mesa mint					X		X	X	X	X	X	
	Pogogyne nudiuscula	otay mesa mint					X		X	X	X	X	X	
	Pycnanthemum californicum		X	X	X		X	X	X	X	X	X	X	X
	Salazaria mexicana			X										
	Salvia apiana	white sage	X	X	X		X	X	X	X	X	X	X	X
	Salvia carduacea	thistle sage	X	X	X		X	X	X	X	X	X	X	X
	Salvia columbariae	chia	X	X	X		X	X	X	X	X	X	X	X

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	Salvia dorrii		X	X	X		X	X	X	X	X	X	X	X
	Salvia leucophylla	purple sage	X	X	X		X	X	X	X	X	X	X	X
	Salvia mellifera	black sage	X	X	X		X	X	X	X	X	X	X	X
	Salvia munzii	Munz's sage										X	X	
	Salvia spathacea	hummingbird sage	X	X	X		X	X	X	X	X	X	X	X
	Satureja chandleri	San Miguel savory								X	X	X	X	
	Satureja douglasii	yerba buena	X	X	X		X	X	X	X	X	X	X	X
	Satureja mimuloides		X	X	X		X	X	X	X	X	X	X	X
	Scutellaria bolanderi	southern skullcap	X	X	X	X	X	X	X	X	X	X	X	
	Scutellaria siphocampyloides		X	X	X		X	X	X	X	X	X	X	X
	Scutellaria tuberosa	Danny's skullcap	X	X	X		X	X	X	X	X	X	X	X
	Stachys ajugoides	hedge-nettle	X	X	X	X	X	X	X	X	X	X	X	X
*	*Stachys albens*	white hedge-nettle	X	X	X		X	X	X	X	X	X	X	X
	Stachys bullata	California hedge-nettle	X	X	X		X	X	X	X	X	X	X	X
	Trichostema austromontanum	hidden lake bluecurls	X	X	X		X	X	X	X	X	X	X	X
	Trichostema lanatum	woolly bluecurls	X	X	X		X	X	X	X	X	X	X	X
	Trichostema lanceolatum	vinegar weed	X	X	X		X	X	X	X	X	X	X	X
	Lauraceae	**Laurel Family**												
	Umbellularia californica	California laurel	X	X	X		X	X	X	X	X	X	X	X

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Lennoaceae	**Lennoa Family**												
Pholisma arenarium	scaly-stemmed sandfood	X						X	X	X	X	X	
Limnanthaceae	**Meadowfoam Family**												
Limnanthes gracilis		X	X	X	X	X	X	X	X	X	X	X	X
Linaceae	**Flax Family**												
Hesperolinon micranthum	dwarf flax	X	X	X		X	X	X	X	X	X	X	X
Linium grandiflorum								X					
Loasaceae	**Loasa Family**												
Mentzelia affinis	yellow comet	X	X	X		X	X	X	X	X	X	X	X
Mentzelia albicaulis	white-stemmed blazing star	X	X	X					X	X			
Mentzelia dispersa		X	X	X		X	X	X	X	X	X	X	X
Mentzelia gracilenta		X	X	X		X	X	X	X	X	X	X	X
Mentzelia laevicaulis	giant blazing star	X	X	X	X	X	X	X	X	X	X	X	X
Mentzelia micrantha	small-flowered stick-leaf	X	X	X		X	X	X	X	X	X	X	X
Mentzelia veatchiana	blazing star	X	X	X		X	X	X	X	X	X	X	X
Petalonyx thurberi	sandpaper plant	X	X	X		X	X	X	X	X	X	X	X
Lythraceae	**Loosestrife Family**												
Ammannia coccinea	valley red-stem	X	X	X		X	X	X	X	X	X	X	X
Lythrum californicum	California loosestrife	X	X	X		X	X	X	X	X	X	X	X

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*	*Lythrum hyssopifolia*	Hyssop loosestrife	X	X	X		X	X	X	X	X	X	X	X
	Malvaceae	**Mallow Family**												
	Eremalche exilis	white desert mallow	X											
	Eremalche parryi	mallow	X	X	X		X	X	X	X	X	X	X	X
	Eremalche rotundifolia	desert five-spot	X											
	Herissantia crispa	curly herissantia										X	X	
	Lavatera assurgentiflora	malva rosa, island mallow							X	X	X	X	X	X
	Malacomamnus aboriginum	Indian Valley bush mallow							X	X	X	X	X	
	Malacothamnus clementinus	San Clemente Island bushmallow												X
	Malacothamnus davidsonii	Davidson's bushmallow						X	X	X	X	X	X	
	Malacothamnus densiflorus	many-flowered mallow										X	X	
	Malacothamnus fasciculatus	mesa bushmallow	X	X	X		X	X	X	X	X	X	X	X
	Malacothamnus fremontii		X	X	X		X	X	X	X	X			X
	Malacothamnus marrubioides		X	X	X		X	X	X	X	X			X
	Malacothamnus palmeri	Arroyo Seco bush mallow								X	X			
*	*Malva neglecta*	common mallow	X	X	X	X	X	X	X	X	X	X	X	X
*	*Malva parviflora*	cheeseweed	X	X	X			X	X	X	X		X	X
	Malvella leprosa	alkali-mallow	X	X	X	X	X	X	X	X	X	X	X	X
	Modiola caroliniana		X	X	X		X	X	X	X	X	X	X	X

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Sidalcea hickmanii	checkerbloom	X	X	X		X	X	X	X	X	X	X	X
Sidalcea malvaeflora	checker mallow		X					X					
Sidalcea neomexicana	salt spring checkerbloom	X	X	X				X	X	X	X	X	X
Sidalcea pedata	bird-footed checkerbloom								X	X			
Sphaeralcea ambigua	apricot mallow	X											
Sphaeralcea emoryi		X	X		X								
Martyniaceae	**Unicorn-Plant Family**												
Proboscidea louisianica	common unicorn-plant							X	X	X	X	X	
Myricaceae	**Wax Myrtle Family**												
Myrica californica	California wax myrtle							X	X	X	X	X	
Nyctaginaceae	**Four O'Clock Family**												
Abronia maritima	red sand-verbena							X	X	X	X	X	X
Abronia nana	dwarf abronia		X		X				X	X		X	
Abronia pogonantha	Mojave sand-verbena	X	X		X								
Abronia umbellata								X	X	X	X	X	
Abronia villosa	sand-verbena	X						X	X	X	X	X	
Mirabilis bigelovii	rough wishbone plant	X											
Mirabilis californica	California wishbone bush	X	X	X		X	X	X	X	X	X	X	X
Mirabilis multiflora			X										

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VASCULAR PLANTS–Angiosperms (Dicotyledons)		SIGNIFICANT ECOLOGICAL AREAS											
Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Nymphaeaceae	**Waterlily Family**												
Numphar luteum	cow lily, pond lily		X					X					
Oleaceae	**Olive Family**												
Forestiera pubescens	desert olive	X	X	X		X	X	X	X	X			X
Fraxinus dipetala	California ash	X	X	X		X	X	X	X	X	X	X	X
Fraxinus velutina	velvet ash	X	X	X	X	X	X	X	X	X	X	X	X
Onagraceae	**Evening Primrose Family**												
Camissonia bistorta	California sun cup	X	X	X		X	X	X	X	X	X	X	X
Camissonia boothii	Booth's evening primrose	X	X	X	X			X					
Camissonia californica	California evening primrose	X	X	X	X	X	X	X	X	X	X	X	X
Camissonia campestris	Mojave sun cup	X	X	X	X		X	X	X	X	X	X	X
Camissonia cheiranthifolia	Beach evening primrose							X	X	X	X	X	X
Camissonia claviformis	evening primrose	X	X		X						X	X	
Camissonia confusa		X	X	X		X	X	X	X	X	X	X	X
Camissonia graciliflora		X	X	X		X	X	X	X	X			X
Camissonia guadalupensis	San Clemente Island evening-primrose												X
Camissonia hirtella		X	X	X		X	X	X	X	X	X	X	X
Camissonia ignota		X	X	X		X	X	X	X	X	X	X	X
Camissonia intermedia	intermediate sun-cups	X	X	X		X	X	X	X	X	X	X	X

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Camissonia lewisii	Lewis' evening primrose							X	X	X	X	X	
Camissonia micrantha	small primrose	X	X	X		X	X	X	X	X	X	X	X
Camissonia pallida		X	X		X								
Camissonia palmeri	Palmer primrose	X	X	X	X	X	X	X	X	X			X
Camissonia strigulosa	field evening primrose	X	X	X		X	X	X	X	X	X	X	X
Clarkia bottae	punchbowl godetia	X	X	X		X	X	X	X	X	X	X	X
Clarkia cylindrica	speckled clarkia		X	X		X	X	X					
Clarkia epilobioides	willow-herb clarkia	X	X	X		X	X	X	X	X	X	X	X
Clarkia purpurea	winecup clarkia	X	X	X		X	X	X	X	X	X	X	X
Clarkia rhomboidea		X	X	X		X	X	X	X	X	X	X	X
Clarkia unguiculata	elegant clarkia	X	X	X		X	X	X	X	X		X	
Clarkia xantiana		X	X	X		X	X	X	X	X			X
Epilobium brachycarpum	parched fireweed	X	X			X	X	X	X	X	X	X	X
Epilobium canum	California fuchsia	X	X	X		X	X	X	X	X	X	X	X
Epilobium ciliatum	California cottonweed	X	X	X	X	X	X	X	X	X	X	X	X
Epilobium foliosum			X										
Epilobium pygmaeum		X	X	X		X	X	X	X	X	X	X	X
Gaura coccinea	wild honeysuckle	X	X	X		X	X	X	X	X	X	X	X
Gaura sinuata	wavy-leaved gaura	X	X	X		X	X	X	X	X	X	X	X

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	Gayophytum diffusum		X	X	X	X	X	X	X	X	X	X	X	X
	Heterogaura heterandra			X										
	Ludwigia peploides	peploides	X	X	X	X	X	X	X	X	X	X		X
	Oenothera californica	California evening primrose	X	X	X		X	X	X	X	X	X	X	X
	Oenothera deltoides	basket evening primrose						X						
	Oenothera elata	evening primrose	X	X	X	X	X	X	X	X	X	X	X	X
	Oenothera primaveris	yellow-evening primrose	X											
	Orobanchaceae	**Broom-rape Family**												
	Orobanche bulbosa		X	X	X		X	X	X	X	X	X	X	X
	Orobanche californica		X	X	X		X	X	X	X	X	X	X	X
	Orobanche fasciculata	clustered broom-rape	X	X	X		X	X	X	X	X	X	X	X
	Orobanche parishii	short-lobed broom-rape	X	X	X		X	X	X	X	X	X	X	X
	Orobanche uniflora	naked broom-rape		X					X	X	X	X	X	
*	*Orobanche valida*	rock creek broom-rape	X	X	X		X	X	X	X	X	X		X
	Orobanche vallicola								X	X	X	X	X	
	Oxalidaceae	**Oxalis Family**												
	Oxalis albicans	California wood-sorrel	X	X	X		X	X	X	X	X	X	X	X
*	*Oxalis corniculata*	creeping wood-sorrel	X	X	X		X	X	X	X	X	X	X	X
	Oxalis rubra								X					

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Paeoniaceae	**Peony Family**												
Paeonia californica	California peony		X	X			X	X				X	
Papaveraceae	**Poppy Family**												
Argemone corymbosa		X	X		X								
Argemone munita	prickly poppy	X	X	X		X	X	X	X	X	X	X	X
Canbya candida	pigmy poppy	X	X		X				X	X			
Dendromecon harfordii	island tree poppy			X									X
Dendromecon rigida	bush poppy	X	X	X		X	X	X	X	X	X	X	X
Dicentra chrysantha	golden ear-drops	X	X	X		X	X	X	X	X	X	X	X
Dicentra ochroleuca		X	X	X		X	X	X	X	X	X	X	X
Eschscholzia caespitosa	poppy	X	X	X		X	X	X	X	X	X	X	X
Eschscholzia californica	California poppy	X	X	X	X	X	X	X	X	X	X	X	X
Eschscholzia minutiflora		X	X		X								
Eschscholzia ramosa	island poppy												X
Meconella denticulata		X	X	X		X	X	X	X	X	X	X	X
Papaver californicum	fire poppy	X	X	X		X	X	X	X	X	X	X	X
Papaver somniferum	opium poppy	X	X	X		X	X	X	X	X	X	X	X
Platystemon californicus	cream cups	X	X	X		X	X	X	X	X	X	X	X
Stylomecon heterophylla	orange poppy	X	X	X		X	X	X	X	X	X	X	X

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	Plantaginaceae	**Plantain Family**												
	Plantago elongata	annual coast plantain	X	X	X		X	X	X	X	X	X	X	X
	Plantago erecta	western plantain	X	X	X		X	X	X	X	X	X	X	X
*	*Plantago lanceolata*	English plantain	X	X	X		X	X	X	X	X	X	X	X
*	*Plantago major*	common plantain	X	X	X		X	X	X	X	X	X	X	X
	Plantago patagonica		X	X		X								
	Platanaceae	**Sycamore Family**												
	Platanus racemosa	western sycamore	X	X	X		X	X	X	X	X	X	X	X
	Plumbaginaccae	**Leadwort Family**												
	Limonium californicum	western marsh-rosemary							X	X	X	X	X	
	Limonium perezii								X	X	X	X	X	
	Limonium sinatum								X	X	X	X	X	
	Polemoniaceae	**Phlox Family**												
	Allophyllum divaricatum	allophyllum		X	X		X		X					
	Allophyllum gilioides	false gilia		X	X		X		X					
	Allophyllum glutinosum	blue false gilia		X	X		X	X	X					
	Collomia grandiflora		X	X	X		X	X	X	X	X	X	X	X
	Eriastrum densifolium	woolly-star flower	X	X	X	X	X	X	X	X	X	X	X	X
	Eriastrum diffusum	spreading blue mantle	X			X								

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Eriastrum eremicum	blue mantle	X			X								
Eriastrum filifolium			X					X	X	X	X	X	
Eriastrum pluriflorum	many flowered eriastrum	X	X		X								
Eriastrum sapphirinum	sapphire eriastrum	X	X	X		X	X	X	X	X	X	X	X
Eriastrum sparsiflorum			X										
Gilia achilleifolia	blue gilia			X			X	X	X	X	X	X	
Gilia aliquanta		X	X	X	X				X	X			
Gilia angelensis	angel gilia	X	X	X		X	X	X	X	X	X	X	X
Gilia australis		X	X	X		X	X	X	X	X	X	X	X
Gilia brecciarum		X	X	X		X	X	X	X	X			X
Gilia cana	gilia	X	X		X								
Gilia capitata	blue field gilia	X	X	X		X	X	X	X	X	X	X	X
Gilia caryifolia	caraway-leaved gilia										X	X	
Gilia clivorum	hillside gilia	X	X	X		X	X	X	X	X	X		X
Gilia diegensis		X	X	X					X	X	X	X	
Gilia hutchinsifolia	desert pale gilia	X	X		X								
Gilia latiflora	broad flowered gilia	X	X		X								
Gilia leptomeria	sand gilia	X											
Gilia malior		X	X		X								

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Gilia micromeria	small flowered gilia	X											
Gilia minor	dwarf gilia	X	X		X								
Gilia nevinii	Nevin's gilia			X									X
Gilia ochroleuca		X	X	X	X				X	X			
Gilia sinuata	gilia	X	X		X		X						
Gilia splendens	splendid gilia		X					X			X	X	
Ipomopsis tenuifolia	slender-leaved ipomopsis										X	X	
Leptodactylon californicum	prickly phlox	X	X	X		X	X	X	X	X	X	X	X
Linanthus aureus	golden gilia	X	X		X								
Linanthus bigelovii		X	X	X		X	X	X	X	X			X
Linanthus breviculus		X	X	X	X				X	X			
Linanthus ciliatus	whisker brush	X	X	X		X	X	X	X	X	X	X	X
Linanthus concinnus	San Gabriel linanthus	X		X					X	X			
Linanthus dianthiflorus	ground-pink	X	X	X		X	X	X	X	X			X
Linanthus dichotomus	evening snow	X	X	X		X	X	X	X	X	X	X	X
Linanthus floribundus	Santa Rosa Mountains linanthus	X		X					X	X	X	X	
Linanthus liniflorus	flax-flowered linanthus	X	X	X	X	X	X	X	X	X	X	X	X
Linanthus orcuttii	Orcutt's linanthus								X	X		X	
Linanthus parryae	sand blossom	X	X	X	X	X	X	X	X	X	X	X	X

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Linanthus parviflorus	coast baby-star	X	X	X		X	X	X	X	X	X	X	X
Linanthus pygmaeus		X	X	X		X	X	X	X	X	X	X	X
Loeseliastrum matthewsii	desert calico	X	X		X								
Loeselliastrum schottii	little sunbonnets	X	X		X								
Navarretia atractyloides	holly-leaved navarretia	X	X	X		X	X	X	X	X			X
Navarretia fossalis	spreading navarretia	X	X	X		X	X	X	X	X	X	X	X
Navarretia hamata	hooked navarretia	X	X	X		X	X	X	X	X	X	X	X
Navarretia jaredii	paso robles navarretia	X	X	X		X	X	X	X	X	X	X	X
Navarretia peninsularis	Baja navarretia	X	X	X	X	X	X	X	X	X	X	X	X
Navarretia prostrata	prostrate navarretia							X	X	X	X	X	
Navarretia pubescens								X					
Phlox gracilis		X	X	X	X	X	X	X	X	X	X	X	X
Polygalaceae	**Milkwort Family**												
Polygala cornuta	Fish's milkwort	X	X	X		X	X	X	X	X	X	X	
Polygonaceae	**Buckwheat Family**												
Centrostegia thurberi	Thurber's spineflower	X	X	X	X	X	X	X	X	X	X	X	X
Chorizanthe blakleyi	Blakley's spineflower	X	X	X		X	X	X	X	X	X		X
Chorizanthe brevicornu	brittle spineflower	X	X		X								
Chorizanthe fimbriata	fringed spineflower										X	X	

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Chorizanthe parryi		X	X	X		X	X	X	X	X		X	X
Chorizanthe polygonoides	long-spined spineflower	X	X	X		X	X	X	X	X	X	X	X
Chorizanthe procumbens	prostrate spineflower	X	X	X		X	X	X	X	X	X	X	X
Chorizanthe rigida	rigid spiny-herb	X	X		X								
Chorizanthe spinosa	Mohave spineflower	X	X		X								
Chorizanthe staticoides	turkish rugging		X	X			X	X					
Chorizanthe watsonii	Watson's spineflower	X	X		X								
Chorizanthe xanti	spineflower	X	X	X		X	X	X	X	X			X
Dodecahema leptoceras	slender-horned spineflower	X	X	X		X	X	X	X	X			X
Eriogonum angulosum	angle-stem skeletonweed	X	X								X	X	
Eriogonum baileyi	Bailey skeletonweed	X	X	X	X	X	X	X	X	X			X
Eriogonum brachyanthum	wild buckwheat	X	X		X		X						
Eriogonum cinereum	ashy-leaved buckwheat							X	X	X	X	X	
Eriogonum cithariforme			X					X					
Eriogonum crocatum	conejo buckwheat							X					
Eriogonum davidsonii		X	X	X		X	X	X	X	X	X	X	X
Eriogonum deflexum	skeletonweed	X	X		X				X	X			
Eriogonum elongatum	wand buckwheat	X	X	X	X	X	X	X	X	X	X	X	X
Eriogonum fasciculatum	California buckwheat	X	X	X	X	X	X	X	X	X	X	X	X

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Eriogonum foliosum	leafy buckwheat								X	X	X	X	
Eriogonum giganteum	St. Catherine's lace												X
Eriogonum gracile	slender woolly buckwheat	X	X	X	X	X	X	X	X	X	X	X	X
Eriogonum gracillium	slender skeletonweed	X	X	X		X	X	X	X	X			
Eriogonum grande	island buckwheat												X
Eriogonum inerme		X	X	X		X	X	X	X	X			
Eriogonum inflatum	desert trumpet	X	X		X								
Eriogonum kennedyi	southern mountain buckwheat	X	X	X		X	X	X	X	X			X
Eriogonum maculatum	Spotted buckwheat	X	X	X		X	X	X	X	X			X
Eriogonum microthecum	San Bernardino buckwheat	X	X	X	X	X	X	X	X	X	X	X	X
Eriogonum mohavense	Mohave skeletonweed	X	X		X								
Eriogonum nidularium	bird's nest buckwheat	X	X		X								
Eriogonum nudum		X	X	X	X	X	X	X	X	X	X	X	X
Eriogonum ordii		X	X	X		X	X	X	X	X			X
Eriogonum ovalifolium	Cushenbury buckwheat								X	X			
Eriogonum parishii		X	X	X		X	X	X	X	X	X	X	X
Eriogonum parvifolium								X	X	X	X	X	
Eriogonum plumatella	flat topped perennial buckwheat	X	X		X								
Eriogonum pusillum	yellow turbans	X	X	X	X	X	X	X	X	X			X

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VASCULAR PLANTS–Angiosperms (Dicotyledons)		SIGNIFICANT ECOLOGICAL AREAS											
Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Eriogonum reinforme	kidney skeletonweed	X	X		X								
Eriogonum roseum		X	X	X		X	X	X	X	X			X
Eriogonum saxatile		X	X	X		X	X	X	X	X	X	X	X
Eriogonum thurberi		X	X		X				X	X	X	X	
Eriogonum trichopes	little trumpets	X	X	X	X	X	X	X	X	X			X
Eriogonum umbellatum		X	X	X	X	X	X	X	X	X	X	X	X
Eriogonum viridescens	leafy stem buckwheat	X	X	X	X	X	X	X	X	X			X
Eriogonum wrightii		X	X	X		X	X	X	X	X	X	X	X
Goodmania luteola	golden goodmania	X	X		X								
Lastarriaea coriacea		X	X	X		X	X	X	X	X	X	X	X
Mucronea californica	California spineflower	X	X	X		X	X	X	X	X	X	X	X
Mucronea perfoliata	punctured bract	X	X	X		X	X	X	X	X			X
Nemacaulis denudata	coast woolly heads	X	X	X		X	X	X	X	X	X	X	X
Oxytheca caryophylloides	chickweed oxytheca	X	X	X		X	X	X	X	X	X		
Oxytheca parishii	Abram's oxytheca	X	X	X		X	X	X	X	X			
Oxytheca perfoliata	red saucers	X	X		X								
Oxytheca trilobata		X	X	X		X			X	X	X	X	
Polygala cornuta	Fish's milkwort	X	X	X		X	X	X	X	X	X	X	
Polygonum amphibium	water smartweed	X	X	X		X	X	X	X	X	X	X	X

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*	*Polygonum arenastrum*	common knotweed	X	X	X	X	X	X	X	X	X	X	X	X
*	*Polygonum argyrocoleon*	knotweed	X	X	X	X	X	X	X	X	X	X	X	X
	Polygonum hydropiperoides	water pepper	X	X	X		X	X	X	X	X	X	X	X
	Polygonum lapathifolium	willow-weed	X	X	X	X	X	X	X	X	X	X	X	X
	Polygonum punctatum	perennial smartweed	X	X	X	X	X	X	X	X	X	X	X	X
	Pterostegia drymarioides	California thread-stem	X	X	X	X	X	X	X	X	X	X	X	X
	Rumex acetosella	sheep sorrel	X	X	X		X	X	X	X	X	X	X	X
*	*Rumex conglomeratus*	whorled dock	X	X	X		X	X	X	X	X	X	X	X
*	*Rumex crispus*	curly dock	X	X	X	X	X	X	X	X	X	X	X	X
	Rumex hymenosepalus	desert rhubarb	X	X	X	X	X	X	X	X	X	X	X	X
	Rumex kerneri								X	X	X	X	X	
	Rumex maritimus	golden dock	X	X	X	X	X	X	X	X	X	X	X	X
*	*Rumex pulcher*	Fiddle rock	X	X	X	X	X	X	X	X	X	X	X	X
	Rumex salicifolius	willow dock	X	X	X		X	X	X	X	X	X	X	X
	Portulacaceae	**Purslane Family**												
	Calandrinia breweri	Brewer's calandrinia	X	X	X		X	X	X	X	X	X	X	
	Calandrinia ciliata	red maids	X	X	X		X	X	X	X	X	X	X	X
	Calandrinia maritima	seaside calandrinia			X				X	X	X	X	X	X
	Calyptridium monandrum	common calyptridium	X	X	X		X	X	X	X	X	X	X	X

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	Claytonia exigua		X	X	X		X	X	X	X	X	X	X	
	Claytonia lanceolata	Peirson's spring beauty	X		X					X	X			
	Claytonia parviflora		X	X	X		X	X	X	X	X	X	X	X
	Claytonia perfoliata	miner's lettuce	X	X	X		X	X	X	X	X	X	X	X
	Claytonia rubra			X										
	Lewisia brachycalyx	short-sepaled lewisia								X	X	X	X	
	Lewisia rediviva	bitter root	X	X	X		X	X	X	X	X			
	Portulaca halimoides	desert portulaca	X	X	X		X	X	X	X	X	X	X	X
*	*Portulaca oleracea*	common purslane	X	X	X	X	X	X	X	X	X	X	X	X
	Primulaceae	**Primrose Family**												
	Adrosace elongata	California androsace		X					X	X	X	X	X	
*	*Anagallis arvensis*	scarlet pimpernel	X	X	X		X	X	X	X	X	X	X	X
	Centunculus minimis	common chaffweed							X	X	X	X	X	
	Dodecatheon clevelandii		X	X	X		X	X	X	X	X	X	X	X
	Samolus parviflorus	water-pimpernel, brookweed	X	X	X		X	X	X	X	X			
	Ranunculaceae	**Buttercup Family**												
	Aquilegia formosa	columbine	X	X	X		X	X	X	X	X	X	X	
	Camissonia lewisii	Lewis's evening-primrose			X					X	X	X	X	
	Clematis lasiantha	pipestems	X	X	X		X	X	X	X	X	X	X	X

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Clematis ligusticifolia	virgin's bower	X	X	X	X	X	X	X	X	X	X	X	X
Clematis pauciflora	ropevine	X	X	X		X	X	X	X	X	X	X	X
Delphinium cardinale	scarlet larkspur	X	X	X		X	X	X	X	X	X	X	X
Delphinium hesperium	Cuyamaca larkspur								X	X	X	X	
Delphinium inopinum	unexpected larkspur								X	X			
Delphinium parishii	desert larkspur	X	X	X		X	X	X	X	X			
Delphinium patens		X	X	X		X	X	X	X	X	X	X	X
Delphinium variegatum	royal larkspur												X
Isopyrum occidentale		X	X	X		X	X	X	X	X			
Myosurus minimus	little mousetail		X			X		X					
Populus fremontii	cottonwood	X					X						
Ranunculus aquatilis		X	X	X		X	X	X	X	X	X	X	
Ranunculus californicus	California buttercup	X	X	X		X	X	X	X	X	X	X	X
Ranunculus cymbalaria		X	X		X			X					
Ranunculus hebecarpus		X	X	X		X	X	X	X	X	X	X	
Ranunculus repens								X	X	X	X	X	
Thalictrum fendleri		X	X	X		X	X	X	X	X	X	X	
Resdaceae	**Mignonette Family**												
Oligomeris linifolia	narrow-leaved oligomeris	X	X	X		X	X	X	X	X	X	X	X

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Rhamnaceae	**Buckthorn Family**												
Ceanothus arboreus	Catalina ceanothus												X
Ceanothus crassifolius	hoary leaf ceanothus	X	X	X		X	X	X	X	X	X	X	
Ceanothus cuneatus	buck brush	X	X	X		X	X	X	X	X	X	X	X
Ceanothus greggii	desert California lilac	X	X	X		X	X	X	X	X	X	X	
Ceanothus integerrimus	deer brush	X	X	X		X	X	X	X	X	X	X	
Ceanothus leucodermis	chaparral whitethorn	X	X	X		X	X	X	X	X	X	X	
Ceanothus megacarpus	big-podded ceanothus												X
Ceanothus oliganthus	hairy ceanothus	X	X	X		X	X	X	X	X	X	X	
Ceanothus spinosus	green bark ceanothus	X	X	X		X	X	X	X	X	X	X	
Ceanothus tomentosus	woolly-leaved ceanothus						X	X	X	X	X	X	
Ceanothus verrucosus	wart-stemmed ceanothus						X	X	X	X	X	X	
Rhamnus californica	California coffeeberry	X	X	X		X	X	X	X	X	X	X	X
Rhamnus crocea	spiny redberry	X	X	X		X	X	X	X	X	X	X	X
Rhamnus ilicifolia	holly-leaf redberry	X	X	X		X	X	X	X	X	X	X	X
Rhamnus pirifolia	island buckthorn												X
Rhamnus tomentella		X	X	X		X	X	X	X	X	X	X	X
Rosaceae	**Rose Family**												
Adenostoma fasciculatum	chamise	X	X	X		X	X	X	X	X	X	X	X

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Adenostoma sparsifolium	red shanks	X	X	X		X	X	X	X	X	X	X	
Amelanchier utahensis	Utah service-berry	X	X	X		X	X	X	X	X	X	X	X
Aphanes occidentalis	western lady's mantle	X	X	X		X	X	X	X	X	X	X	X
Cercocarpus betuloides	birch-leaf mountain-mahogany	X	X	X		X	X	X	X	X	X	X	X
Cercocarpus traskiae	Catalina Island Mountain-mahogany												X
Heteromeles arbutifolia	toyon	X	X	X		X	X	X	X	X	X	X	X
Heteromeles arbutifolia macrocarpa	toyon	X	X	X		X	X	X	X	X	X	X	X
Holodiscus discolor	oceanspray	X	X	X		X	X	X	X	X			X
Horkelia cuneata								X	X	X		X	
Horkelia truncata	ramona horkelia								X	X	X	X	
Lyonothamnus floribundus	Santa Catalina Island ironwood												X
Potentilla anserina	sticky cinquefoil							X	X	X	X	X	
Potentilla glandulosa	cinquefoil	X	X	X		X	X	X	X	X	X	X	X
Potentilla multijuga	ballona cinquefoil							X					
* *Prunus dulcis*	almond		X										
Prunus emarginata	bitter cherry	X	X	X		X	X	X	X	X	X	X	
Prunus fasciculata	desert almond	X	X	X		X	X	X	X	X	X	X	
Prunus ilicifolia	holly-leaved cherry	X	X	X		X	X	X	X	X	X	X	X
Prunus virginiana	western choke-cherry	X	X	X		X	X	X	X	X	X	X	X

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	Purshia tridentata	antelope bush	X	X	X		X	X	X	X	X	X	X	
	Rosa californica	California wild rose	X	X	X		X	X	X	X	X	X	X	X
	Rosa gymnocarpa	wild rose						X		X	X	X	X	
*	*Rubus discolor*		X	X	X		X	X	X	X	X	X	X	X
	Rubus glaucifolius	Cuyamaca raspberry		X								X	X	
	Rubus ursinus	California blackberry	X	X	X		X	X	X	X	X	X	X	X
	Rubiaceae	**Madder Family**												
	Galium andrewsii		X	X	X		X	X	X	X	X	X	X	X
	Galium angustifolium	shrubby bedstraw	X	X	X		X	X	X	X	X	X	X	X
*	*Galium aparine*	goose grass	X	X	X		X	X	X	X	X	X	X	X
	Galium californicum	Cone Peak bedstraw	X	X	X		X	X	X	X	X	X	X	
	Galium catalinense	Santa Catalina bedstraw												X
	Galium cliftonsmithii	Santa Barbara bedstraw	X	X	X		X	X	X					
	Galium grande	San Gabriel bedstraw	X		X			X		X	X			
	Galium hallii	nodding bedstraw	X	X	X		X	X	X	X	X			
	Galium jepsonii	Jepson’s bedstraw	X		X			X		X	X			
	Galium johnstonii	Johnston’s bedstraw	X		X			X		X	X			
	Galium nuttallii	San Diego bedstraw	X	X	X		X	X	X	X	X	X	X	X
*	*Galium parisiense*	wall bedstraw		X										

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Galium porrigens	climbing bedstraw	X	X	X		X	X	X	X	X	X	X	X
Sherardia arvensis								X	X	X	X	X	
Salicaceae	**Willow Family**												
Populus balsamifera	black cottonwood	X	X	X			X	X	X	X	X	X	X
Populus fremontii	Fremont's cottonwood	X	X	X			X	X	X	X	X	X	X
Populus tremuloides	quaking aspen								X	X			
Salix exigua	sandbar willow	X	X	X			X	X	X	X	X	X	X
Salix goodingii	black willow	X	X				X	X	X	X		X	
Salix laevigata	red willow	X	X	X			X	X	X	X	X	X	X
Salix lasiolepis	arroyo willow	X	X	X			X	X	X	X	X	X	X
Salix lucida	shining willow	X	X	X			X	X	X	X	X	X	X
Saururaceae	**Lizard's-Tail Family**												
Anemopsis californica	yerba mansa	X	X	X	X			X	X	X		X	
Saxifragaceae	**Saxifrage Family**												
Boykinia occidentalis		X	X	X		X	X	X	X	X			
Boykinia rotundifolia	round-leaved boykinia	X	X	X		X	X	X	X	X	X	X	
Heuchera abramsii	Abram’s alumroot	X		X			X		X	X			
Heuchera brevistaminea	wiggins (Mount Laguna alumroot)										X	X	
Heuchera elegans	urn-flowered alumroot	X		X			X		X	X			

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Heuchera rubescens	San Diego county alumroot		X								X	X	
Jepsonia malvaefolia	island jepsonia												X
Jepsonia parryi	mesa saxifrage							X	X	X	X	X	
Lithophragma affine	woodland star	X	X	X		X	X	X	X	X	X	X	X
Lithophragma bolanderi		X	X	X					X	X			
Lithophragma heterophyllum	saxifrage		X	X		X	X	X					
Lithophragma parviflorum		X	X	X		X	X	X					
Ribes californicum	hillside gooseberry	X	X	X		X	X	X	X	X	X	X	
Ribes speciosum	fuchsia flowered gooseberry	X	X	X		X	X	X	X	X	X	X	
Saxifraga californica	California saxifrage	X	X	X		X	X	X	X	X	X	X	X
Scrophulariaceae	**Figwort Family**												
Antirrhinum coulterianum	white snapdragon	X	X	X		X	X	X	X	X	X	X	
Antirrhinum kelloggii		X	X	X		X	X	X	X	X	X	X	X
Antirrhinum multiflorum		X	X	X		X	X	X	X	X			
Antirrhinum nuttallianum	Nuttall's snapdragon	X	X	X		X	X	X	X	X	X	X	X
Castilleja affinis	coast paintbrush	X	X	X		X	X	X	X	X	X	X	X
Castilleja chromosa	Indian paintbrush		X				X						
Castilleja densiflora	dense-flowered owl's-clover	X	X	X		X	X	X	X	X	X	X	X
Castilleja exserta	purple owl's-clover	X	X	X		X	X	X	X	X	X	X	X

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Castilleja foliolosa	woolly Indian paintbrush		X					X					X
Castilleja lasiorhyncha	San Bernardino Mountains owl's clover										X	X	
Castilleja linariifolia		X	X	X	X	X	X	X	X	X			
Castilleja minor			X					X			X	X	X
Castilleja montigena	Heckard's Indian paintbrush								X	X			
Castilleja plagiotoma	Mojave Indian paintbrush	X	X	X	X	X	X	X	X	X			
Castilleja subinclusa		X	X	X		X	X	X	X	X			
Collinsia bartsiifolia	lowland Chinese houses	X	X		X								
Collinsia callosa		X	X	X		X	X	X	X	X			
Collinsia childii		X	X	X		X	X	X	X	X	X	X	
Collinsia heterophylla	Chinese houses	X	X	X		X	X	X	X	X	X	X	X
Collinsia parryi	Collinsia	X	X	X		X	X	X	X	X			
Collinsia parviflora	blue-eyed Mary	X	X	X		X	X	X	X	X			X
Cordylanthus eremicus	desert bird's beak								X	X			
Cordylanthus filifolius	dark-tipped bird's beak						X						
Cordylanthus maritimus	alkali bird's beak	X						X	X	X	X	X	
Cordylanthus rigidus	thread-leaved bird's-beak	X	X	X		X	X	X	X	X	X	X	X
Galvezia speciosa	showy island snapdragon												X
Keckiella antirrhinoides		X	X		X						X	X	

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Keckiella breviflora	small-leaved penstemon	X	X	X		X	X	X	X	X			
Keckiella cordifolia	heart-leaved penstemon	X	X	X		X	X	X	X	X	X	X	X
Keckiella ternata		X	X	X		X	X	X	X	X	X	X	X
* *Kickxia elatine*	fluellin	X	X	X		X	X	X	X	X	X	X	X
* *Kickxia spurria*	fluellin	X	X	X		X	X	X	X	X	X	X	X
Linaria canadensis	blue toadflax	X	X	X		X	X	X	X	X			
Mimulus androsaceus		X	X	X		X	X	X					
Mimulus aurantiacus	orange bush monkey-flower	X	X	X		X	X	X	X	X	X	X	X
Mimulus brevipes	wide-throated monkey-flower	X	X	X		X	X	X	X	X	X	X	X
Mimulus cardinalis	scarlet monkey-flower	X	X	X		X	X	X	X	X	X	X	X
Mimulus clevelandii	Cleveland's bush monkey-flower										X	X	
Mimulus constrictus	orange bush monkey-flower	X	X	X		X	X						
Mimulus floribundus		X	X	X		X	X	X	X	X	X	X	X
Mimulus fremontii	fremont monkeyflower	X	X	X		X	X	X	X	X	X	X	X
Mimulus guttatus	common monkey-flower		X	X			X	X				X	
Mimulus latidens			X					X	X	X	X	X	
Mimulus parishii		X	X	X		X	X	X	X	X	X	X	X
Mimulus pilosus	miminanthe	X	X	X		X	X	X	X	X	X	X	X
Mimulus rubellus	red monkeyflower	X											

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VASCULAR PLANTS–Angiosperms (Dicotyledons)		SIGNIFICANT ECOLOGICAL AREAS											
Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Mimulus traskiae	Santa Catalina Island monkey-flower												X
Orobanche bulbosa		X	X	X		X	X	X	X	X	X	X	X
Orobanche fasciculata	clustered broom-rape	X	X	X		X	X	X	X	X	X	X	X
Orobanche parishii		X	X	X		X	X	X	X	X	X	X	X
Pedicularis densiflora	Indian warrior	X	X	X		X	X	X	X	X	X	X	X
Penstemon californicus	California beardtongue								X	X	X	X	
Penstemon centranthifolius	scarlet bugler	X	X	X		X	X	X	X	X	X	X	X
Penstemon clevelandii	San Jacinto beardtongue										X	X	
Penstemon grinnelli		X	X	X		X	X				X		
Penstemon heterophyllus	foothill penstemon		X	X				X				X	
Penstemon labrosus		X	X	X		X	X	X	X	X	X	X	
Penstemon rostriflorus		X	X	X		X	X	X	X	X	X	X	X
Penstemon spectabilis	royal penstemon	X	X	X		X	X	X	X	X	X	X	
Penstemon thurberi	Thurber’s beardtongue	X	X		X				X	X	X	X	
Scrophularia californica	California figwort	X	X	X		X	X	X	X	X	X	X	X
Scrophularia villosa	Santa Catalina figwort												X
* *Verbascum thapsus*	woolly mullein	X	X	X		X	X	X	X	X	X	X	X
* *Verbascum virgatum*	wand mullein	X	X	X		X	X	X	X	X	X	X	X

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	Solanaceae	**Nightshade Family**												
*	*Datura stramonium*	jimson weed	X	X	X		X	X	X	X	X	X	X	X
	Datura wrightii	jimson weed	X	X	X		X	X	X	X	X	X	X	X
	Lycium andersonii	wolfberry	X	X	X		X	X	X	X	X	X	X	
	Lycium brevipes	Santa Catalina Island desert-thorn							X	X	X	X	X	X
	Lycium californicum	California box-thorn							X	X	X	X	X	X
	Lycium cooperi	peachthorn	X	X		X								
	Lycium hassei	Santa Catalina Island desert thorn							X	X	X		X	X
	Lycium parishii	Parish's desert-thorn							X	X	X	X	X	
	Nicotiana attenuata	coyote tobacco	X	X	X	X	X	X		X	X	X	X	
	Nicotiana bigelovii	Wallace's tobacco			X									
*	*Nicotiana glauca*	tree tobacco	X	X	X		X	X	X	X	X	X	X	X
	Nicotiana quadrivalvis	Wallace's tobacco	X	X	X		X	X	X	X	X	X	X	X
	Petunia parviflora	wild petunia							X	X	X	X	X	
	Solanum americanum	small-flowered nightshade	X	X	X		X	X	X	X	X	X	X	X
	Solanum douglasii	Douglas' nightshade	X	X	X	X	X	X	X	X	X	X	X	X
*	*Solanum elaeagnifolium*	white horse-nettle	X	X	X	X	X	X	X	X	X	X	X	X
	Solanum nigrum	black nightshade	X											
	Solanum parishii	Parish's nightshade	X	X	X		X	X	X	X	X	X	X	X

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*	*Solanum rostratum*	buffalo berry							X	X	X	X	X	
*	*Solanum sarrachoides*	hairy nightshade							X	X	X	X	X	
	Solanum umbelliferum	blue witch	X	X	X		X	X	X	X	X	X	X	X
	Solanum wallacei	Wallace's nightshade												X
	Solanum xanti	chaparral nightshade	X	X	X		X	X	X	X	X	X	X	X
	Sterculiaceae	**Cacao Family**												
	Fremontodendron californicum		X	X	X		X	X	X	X	X	X	X	X
	Fremontodendron mexicanum	Mexican flannelbrush								X	X	X	X	
	Tamaricaceae	**Tamarisk Family**												
*	*Tamarix aphylla*	athel	X	X					X	X	X	X	X	
*	*Tamarix chinensis*	tamarisk	X	X		X			X	X	X	X	X	
*	*Tamarix parviflora*	small-flowered tamarisk	X	X		X			X	X	X	X	X	
*	*Tamarix ramosissima*	Mediterranean tamarisk	X	X	X	X	X	X	X	X	X			
	Urticaceae	**Nettle Family**												
	Hesperocnide tenella	western nettle	X	X	X		X	X	X	X	X	X	X	X
	Parietaria hespera	western pellitory	X	X	X		X	X	X	X	X	X	X	X
	Soleirolia soleirolii	Baby's tears							X	X	X	X	X	
	Urtica dioica	giant creek nettle	X	X	X		X	X	X	X	X	X	X	X
	Urtica holosericea	stinging nettle	X	X	X		X	X	X	X	X	X	X	X

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*	*Urtica urens*	dwarf nettle	X	X	X		X	X	X	X	X	X	X	X
	Valerianaceae	**Valerian Family**												
	Plectritis ciliosa	long-spurred plectritis	X	X	X		X	X	X	X	X	X	X	X
	Verbenaceae	**Vervain Family**												
	Phyla lanceolata		X	X		X			X	X	X	X	X	
	Phyla nodiflora								X	X	X	X	X	
	Verbena lasiostachys	western verbena	X	X	X		X	X	X	X	X	X	X	X
	Verbena menthifolia	mint-leaved verbena						X	X	X	X	X	X	
	Verbena robusta	verbena						X						
	Violaceae	**Violet Family**												
	Viola aurea	golden violet	X	X		X				X	X			
	Viola pedunculata	johnny-jump-up	X	X	X		X	X	X	X	X	X	X	X
	Viola pinetorum	grey-leaved violet	X	X	X		X	X	X					
	Viola purpurea		X	X	X		X	X	X	X	X	X	X	X
	Viscaceae	**Mistletoe Family**												
	Arceuthobium occidentale	foothill pine dwarf mistletoe	X	X	X		X	X	X					
	Phoradendron californicum	desert mistletoe	X	X		X								
	Phoradendron densum	dense mistletoe	X	X	X		X	X	X	X	X	X	X	
	Phoradendron macrophyllum	big leaf mistletoe	X	X	X		X	X	X	X	X	X	X	

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Phoradendron villosum	oak mistletoe	X	X	X		X	X	X	X	X	X	X	
Vitaceae	**Grape Family**												
Vitis girdiana	desert wild grape	X	X	X		X	X	X	X	X	X	X	X
Zygophyllaceae	**Caltrop Family**												
Larrea tridenta		X	X		X								

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	Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
	Alismataceae	**Water-Plantain Family**												
	Alisma plantago-aquatica	water plantain	X	X	X		X	X	X	X	X	X	X	X
	Echinodorus berteroi		X	X	X		X	X	X	X	X	X	X	X
	Sagittaria sanfordii	Sanford's arrowhead							X	X	X	X	X	
	Cyperaceae	**Sedge Family**												
	Carex alma		X	X	X		X	X	X	X	X	X	X	
	Carex barbarae								X	X	X	X	X	
	Carex diandra		X	X	X		X	X	X	X	X	X	X	X
	Carex fracta		X	X	X		X	X	X	X	X	X	X	
	Carex lanuginosa	woolly sedge	X	X	X	X				X	X			
	Carex multicaulis		X	X	X		X	X	X	X	X	X	X	
	Carex praegracilis	clustered field sedge	X	X	X		X	X	X	X	X	X	X	X
	Carex schottii		X	X	X		X	X	X	X	X	X	X	
	Carex senta	rough sedge	X	X	X		X	X	X	X	X	X	X	X
	Carex spissa	San Diego sedge							X	X	X	X	X	
	Carex triquetra	triangular-fruited sedge	X	X	X		X	X	X	X	X	X	X	X
*	*Cyperus difformis*	variable nutsedge	X	X	X		X	X	X	X	X	X	X	X
	Cyperus eragrostis	tall cyperus	X	X	X		X	X	X	X	X	X	X	X
	Cyperus erythrorhizos	red-rooted cyperus	X	X	X	X	X	X	X	X	X	X	X	X

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	Cyperus esculentus	yellow nut-grass	X	X	X	X	X	X	X	X	X	X	X	X
*	*Cyperus involucratus*	umbrella-plant							X	X	X	X	X	
	Cyperus niger	brown cyperus							X	X	X	X	X	
	Cyperus odoratus	coarse cyperus							X	X	X	X	X	
*	*Cyperus rotundus*	purple nutsedge							X	X	X	X	X	
	Eleocharis acicularis	needle-stemmed spikerush	X	X	X		X	X	X	X	X	X	X	X
	Eleocharis macrostachya		X	X	X	X	X	X	X	X	X	X	X	X
	Eleocharis montevidensis	Argentine spike-rush	X	X	X		X	X	X	X	X	X	X	X
	Eleocharis parishii		X	X	X		X	X	X	X	X	X	X	X
	Eleocharis parvula	small spike-rush	X	X		X								
	Eleocharis radicans		X	X	X		X	X	X	X	X	X	X	X
	Scirpus acutus	hard-stemmed bulrush	X	X	X		X	X	X	X	X	X	X	X
	Scirpus americanus	winged three-square	X	X	X		X	X	X	X	X	X	X	X
	Scirpus californicus	California bulrush	X	X					X	X	X	X	X	
	Scirpus cernuus	California clubrush							X	X	X	X	X	
	Scirpus maritimus	river bulrush	X	X	X		X	X	X	X	X	X	X	X
	Scirpus microcarpus	small-fruited bulrush	X	X	X		X	X	X	X	X	X	X	X
	Scirpus pungens	common threesquare	X	X					X	X	X	X	X	
	Scirpus robustus	Pacific coast bulrush							X	X	X	X	X	

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Iridaceae	**Iris Family**												
Sisyrinchium bellum	blue-eyed-grass	X	X	X		X	X	X	X	X	X	X	X
Juncaceae	**Rush Family**	**7**	**1**	**4**	**2**	**5**	**6**	**3**	**8**	**8**	**12**	**9**	**10**
Juncus acutus	spiny rush							X	X	X	X	X	X
Juncus balticus	wire rush	X	X	X		X	X	X	X	X	X	X	X
Juncus bufonius	toad rush	X	X	X		X	X	X	X	X	X	X	X
Juncus dubius	mariposa rush										X	X	X
Juncus duranii	Duran's rush	X		X					X	X		X	
Juncus effusus	bog rush	X	X	X		X	X	X	X	X	X	X	X
Juncus macrophyllus	long-leaved rush	X	X	X		X	X	X	X	X			
Juncus mexicanus	Mexican rush	X	X	X		X	X	X	X	X	X	X	X
Juncus oxymeris	pointed rush	X	X	X		X	X	X	X	X			
Juncus patens		X	X	X		X	X	X	X	X	X	X	X
Juncus phaeocephalus var. *paniculatus*								X	X	X	X	X	
Juncus rugulosus	wrinkled rush	X	X	X		X	X	X	X	X	X	X	
Juncus textilis	Indian rush	X	X	X		X	X	X	X	X	X	X	X
Juncus torreyi		X	X	X		X	X	X	X	X	X	X	X
Juncus xiphioides	iris-leaved rush	X	X	X		X	X	X	X	X	X	X	X

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Juncaginaceae	**Arrow-Grass Family**												
Triglochin concinna	arrow-grass		X					X	X	X	X	X	
Lemnaceae	**Duckweed Family**												
Lemna gibba	inflated duckweed	X	X	X		X	X	X	X	X	X	X	X
Lemna minor		X	X	X		X	X	X	X	X	X	X	X
Lemna trisulca		X	X					X			X	X	
Wolfiella lingulata	Mud-midget							X	X	X	X	X	
Liliaceae	**Lily Family**												
Allium burlewii		X	X	X	X	X	X	X	X	X	X	X	X
Allium campanulatum		X	X	X	X	X	X	X	X	X	X	X	X
Allium fimbriatum		X	X	X	X	X	X	X	X	X	X	X	X
Allium fimbriatum var. *mohavense*	Mojave fringed onion	X	X	X	X	X	X	X	X	X	X	X	X
Allium haematochiton	red-skinned onion	X	X	X		X	X	X	X	X	X	X	
Allium howellii		X	X	X		X	X	X	X	X			
Allium lacunosum		X	X	X	X	X	X	X	X	X	X	X	
Allium munzii	Munz's onion							X			X	X	
Allium parishii	Parish's onion	X	X		X								
Allium peninsulare	peninsular onion	X	X	X		X	X	X	X	X	X	X	X
Allium praecox	early onion	X	X	X		X	X	X	X	X	X	X	X

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	Androstephium breviflorum	small-flowered androstephium	X	X		X								
*	*Asparagus officinalis*	garden asparagus	X	X	X		X	X	X	X	X	X	X	X
	Bloomeria crocea	common goldenstar	X	X	X		X	X	X	X	X	X	X	
	Brodiaea filifolia	three-leaved brodiaea							X			X	X	X
	Brodiaea jolonensis	dwarf brodiaea	X	X	X		X	X	X	X	X	X	X	X
	Brodiaea orcuttii	Orcutt's brodiaea										X	X	
	Calochortus albus	fairy lantern	X	X	X		X	X	X	X	X			
	Calochortus catalinae	Catalina mariposa lily							X	X	X	X	X	X
	Calochortus clavatus	yellow mariposa lily	X	X	X		X	X	X	X	X			
	Calochortus dunni	Dunn's mariposa lily								X	X	X	X	
	Calochortus invenustus	slender mariposa lily	X	X	X		X	X	X	X	X	X	X	X
	Calochortus kennedyi	slender mariposa lily	X	X	X	X	X	X	X	X	X			
	Calochortus palmeri	Palmer's mariposa lily	X	X	X		X	X	X	X	X			
	Calochortus plummerae	Plummer's mariposa lily							X	X	X	X	X	
	Calochortus splendens	lilac mariposa lily	X	X	X		X	X	X	X	X	X	X	X
	Calochortus striatus	alkali mariposa lily	X	X		X								
	Calochortus venustus		X	X	X		X	X	X	X	X			
	Calochortus weedii	intermediate flowered mariposa lily	X	X	X		X	X	X	X	X	X	X	
	Chlorogalum parviflorum	small-flowered amole							X	X	X	X	X	

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VASCULAR PLANTS–Angiosperms (Monocotyledons)		SIGNIFICANT ECOLOGICAL AREAS											
Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Chlorogalum pomeridianum	soap plant	X	X	X		X	X	X	X	X	X	X	X
Chlorogalum purpureum									X	X			
Dichelostemma capitatum	blue dicks	X	X	X	X	X	X	X	X	X	X	X	X
Fritillaria biflora	chocolate lily	X	X	X		X	X	X	X	X	X	X	X
Lilium humboldtii	Humboldt lily	X	X	X			X	X	X	X	X	X	
Lilium parryi	lemon lily	X	X	X					X	X			
Muilla coronata	crowned muilla	X	X		X				X	X			
Muilla maritima	common muilla	X	X	X		X	X	X	X	X	X	X	X
Nolina parryi	Parry's nolina	X	X	X		X	X	X	X	X	X	X	X
Yucca brevifolia		X	X		X								
Yucca whipplei	Our Lord’s candle	X	X	X		X	X	X	X	X	X	X	X
Zigadenus brevibracteatus	desert zigadene	X	X		X								
Zigadenus fremontii	Fremont's star-lily	X	X	X		X	X	X	X	X	X	X	X
Orchidaceae	**Orchid Family**												
Epipactis gigantea	stream orchid	X	X	X		X	X	X	X	X	X	X	
Piperia leptopetala		X	X	X		X	X	X	X	X	X	X	
Platanthera leucostachys	white-flowered bog-orchid	X	X	X		X	X	X	X	X	X	X	X
Poaceae	**Grass Family**												
Achnatherum coronatum	giant needlegrass	X	X	X		X	X	X	X	X	X	X	X

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	Achnatherum diegoense	San Diego county needle grass										X	X	X
	Agrostis exarata		X	X	X		X	X	X	X	X	X	X	X
	Agrostis gigantea		X	X	X		X	X	X	X	X	X	X	X
	Agrostis pallens	leafy bentgrass	X	X	X		X	X	X	X	X	X	X	X
*	*Agrostis stolonifera*	redtop	X	X	X		X	X	X	X	X	X	X	
*	*Agrostis viridis*	water bent	X	X	X	X	X	X	X	X	X	X	X	X
*	*Ammophila arenaria*	european beachgrass							X					
*	*Andropogon glomeratus* var. *scabriglumis*	southwestern bushy bluestem	X	X	X		X	X	X	X	X	X	X	X
	Aristida adscensionis	six-weeks three-awn	X	X	X	X	X	X	X	X	X	X	X	X
	Aristida purpurea	parish threeawn	X	X	X	X	X	X	X	X	X	X	X	X
*	*Arundo donax*	giant reed	X		X				X	X	X	X	X	
*	*Avena barbata*	slender wild oat	X	X	X	X	X	X	X	X	X	X	X	X
*	*Avena fatua*	wild oat	X	X	X	X	X	X	X	X	X	X	X	X
*	*Avena sativa*	cultivated oat	X	X	X		X	X	X	X	X	X	X	X
	Bothriochloa barbinodis	cane bluestem	X	X	X		X	X	X	X	X	X	X	X
	Brachypodium distachyon	false-brome							X	X	X	X	X	X
*	*Bromus arenarius*		X	X	X	X	X	X	X	X	X	X	X	X
	Bromus arizonicus		X	X		X			X	X	X	X	X	X
	Bromus carinatus	California brome	X	X	X	X	X	X	X	X	X	X	X	X

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*	*Bromus catharticus*	rescue grass	X	X	X	X	X	X	X	X	X	X	X	X
*	*Bromus diandrus*	ripgut grass	X	X	X	X	X	X	X	X	X	X	X	X
	Bromus grandis		X	X	X		X	X	X	X	X	X	X	
*	*Bromus hordeaceus*	soft chess	X	X	X		X	X	X	X	X	X	X	X
	Bromus laevipus		X	X	X		X	X	X	X	X	X	X	
*	*Bromus madritensis*	foxtail chess	X	X	X	X	X	X	X	X	X	X	X	X
	Bromus marginatus			X										
*	*Bromus mollis*	soft brome						X						
	Bromus orcuttianus	brome	X	X	X		X	X	X	X	X	X	X	
*	*Bromus tectorum*	cheat grass	X	X	X	X	X	X	X	X	X	X	X	X
*	*Bromus trinii*	Chilean chess	X	X	X	X	X	X	X	X	X	X	X	X
*	*Cenchrus longispinus*	mat sandbur	X	X		X			X	X	X	X	X	
*	*Chloris gayana*	Rhodes grass							X	X	X	X	X	
*	*Chloris virgata*	fingergrass	X	X		X			X	X	X	X	X	
*	*Cortaderia jubata*								X					
*	*Cortaderia selloana*	pampas grass							X	X	X	X	X	
*	*Crypsis schoednoides*	swamp grass	X	X	X		X	X	X	X	X	X	X	X
*	*Crypsis vaginiflora*		X	X	X		X	X	X	X	X	X	X	X
*	*Cynodon dactylon*	Bermuda grass	X	X	X	X	X	X	X	X	X	X	X	X

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*	*Dactylis glomerata*	orchard grass	X	X	X		X	X	X	X	X	X	X	X
	Deschampsia danthonioides	annual hairgrass	X	X	X		X	X	X	X	X	X	X	X
*	*Digitaria ischaemum*								X	X	X	X	X	
*	*Digitaria sanguinalis*	hairy crabgrass							X	X	X	X	X	
	Dissanthelium californicum	california dissanthelium												X
	Distichlis spicata	saltgrass	X	X	X	X	X	X	X	X	X	X	X	X
*	*Echinochloa crus-galli*	barnyard grass	X	X	X	X	X	X	X	X	X	X	X	X
	Elymus elymoides	squirreltail	X	X	X	X	X	X	X	X	X	X	X	
	Elymus glaucus	blue wildrye	X	X	X	X	X	X	X	X	X	X	X	X
	Elymus multisetus	big squirreltail	X	X	X	X	X	X	X	X	X	X	X	X
	Elymus stebbinsii	wheatgrass	X	X	X		X	X	X	X	X	X	X	X
*	*Erastgrostis barrelieri*		X	X	X		X	X	X	X	X	X	X	X
*	*Erastgrostis cilianensis*	stink grass	X	X	X	X	X	X	X	X	X	X	X	X
	Erastgrostis pectinacea		X	X	X	X	X	X	X	X	X	X	X	X
*	*Festuca arundinacea*	tall fescue	X	X	X		X	X	X	X	X	X	X	X
*	*Festuca pratensis*	meadow fescue	X	X	X		X	X	X	X	X	X	X	X
*	*Gastridium ventricosum*	nit grass	X	X	X		X	X	X	X	X	X	X	X
	Hordeum brachyantherum	meadow barley	X	X	X	X	X	X	X	X	X	X	X	X
	Hordeum depressum	alkali barley	X	X	X	X	X	X	X	X	X	X	X	X

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	Hordeum intercedens	vernal barley	X	X	X		X	X	X	X	X	X	X	X
	Hordeum jubatum	foxtail barley	X	X	X	X	X	X	X	X	X	X	X	X
	Koeleria macrantha	June grass	X	X	X		X	X	X	X	X	X	X	X
*	*Lamarckia aurea*	goldentop	X	X	X	X	X	X	X	X	X	X	X	X
	Leptochloa uninervia	Mexican sprangletop	X	X	X		X	X	X	X	X	X	X	X
	Leymus cinereus	alkali rye	X	X	X		X	X	X	X	X		X	
	Leymus condensatus		X	X	X	X	X	X	X	X	X	X	X	X
	Leymus condensatus	giant wild rye	X	X	X	X	X	X	X	X	X	X	X	X
	Leymus triticoides	beardless wild rye	X	X	X		X	X	X	X	X	X	X	X
*	*Lolium temulentum*	darnel	X	X	X		X	X	X	X	X	X	X	X
	Melica imperfecta	coast range melic	X	X	X	X	X	X	X	X	X	X	X	X
	Melica stricta		X	X	X		X	X	X	X	X			X
	Monanthochloe littoralis								X	X	X	X	X	X
	Muhlenbergia appressa	appressed muhly												X
	Muhlenbergia asperifolia	scratch grass	X	X	X	X	X	X	X	X	X	X	X	X
	Muhlenbergia californica	california muhly	X		X				X	X	X	X	X	
	Muhlenbergia microsperma	littleseed muhly	X	X	X	X	X	X	X	X	X	X	X	X
	Muhlenbergia rigens	deergrass	X	X	X		X	X	X	X	X	X	X	X
	Nassella cernua	nodding needlegrass	X	X	X		X	X	X	X	X	X	X	X

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	Nassella lepida	small-flowered needlegrass	X	X	X		X	X	X	X	X	X	X	X
	Nassella pulchra	purple needlegrass	X	X	X		X	X	X	X	X	X	X	X
	Orcuttia californica	California orcutt grass	X	X	X		X	X	X	X	X	X	X	X
	Panicum capillare	witchgrass	X	X	X	X	X	X	X	X	X	X	X	X
*	*Panicum miliaceum*	broom corn millet	X	X	X		X	X	X	X	X	X	X	X
*	*Parapholis incurva*	sickle grass							X	X	X	X	X	X
*	*Paspalum dilatatum*	dallis grass	X	X	X	X	X	X	X	X	X	X	X	X
	Paspalum distichum	knotgrass	X	X	X	X	X	X	X	X	X	X	X	X
*	*Pennisetum clandestinum*	kikuyu grass							X	X	X	X	X	
*	*Pennisetum setaceum*	fountain grass		X					X	X	X	X	X	
*	*Phalaris aquatica*	Harding grass		X					X	X	X	X	X	
*	*Phalaris canariensis*	canary grass			X				X	X	X	X	X	
*	*Phalaris minor*	Mediterranean canary grass	X	X	X		X	X	X	X	X	X	X	X
*	*Phalaris paradoxa*		X	X	X		X	X	X	X	X	X	X	X
*	*Piptatherum miliaceum*	smilo grass		X					X	X	X	X	X	X
*	*Poa annua*	annual bluegrass	X	X	X	X	X	X	X	X	X	X	X	X
	Poa atropurpurea	San Bernardino blue grass								X	X	X	X	
*	*Poa palustris*	fowl bluegrass	X		X				X	X	X			
*	*Poa pratensis*	Kentucky bluegrass	X	X	X	X	X	X	X	X	X	X	X	X

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	Poa secunda	Malpais bluegrass	X	X	X	X	X	X	X	X	X	X	X	X
*	*Polypogon interruptus*	ditch beard grass	X	X	X	X	X	X	X	X	X	X	X	X
*	*Polypogon monspeliensis*	annual beard grass	X	X	X	X	X	X	X	X	X	X	X	X
	Puccinellia simplex	alkali grass	X	X		X								
*	*Schismus arabicus*	Arabian grass	X	X		X								X
*	*Schismus barbatus*	Mediterranean schismus	X	X	X		X	X	X	X	X	X	X	X
	Setaria gracilis		X	X		X			X	X	X	X	X	
*	*Setaria pumila*	yellow bristle grass	X	X		X			X	X	X	X	X	
*	*Setaria viridis*		X	X	X		X	X	X	X	X	X	X	X
*	*Sorghum halepense*	Johnsongrass	X	X	X		X	X	X	X	X	X	X	X
	Sphenopholis obtusata	prairie wedge grass							X	X	X	X	X	
	Sporobolus airoides	alkali sacaton	X	X	X		X	X	X	X	X	X	X	X
*	*Sporobolus indicus*	smutgrass							X	X	X	X	X	
*	*Stenotaphrum secundatum*	St. Augustine grass							X	X	X	X	X	
*	*Vulpia bromoides*	false brome fescue	X	X	X		X	X	X	X	X	X	X	X
	Vulpia microstachys	Pacific fescue	X	X	X		X	X	X	X	X	X	X	X
*	*Vulpia myuros*	fescue	X	X	X	X	X	X	X	X	X	X	X	X
	Vulpia octoflora	hairy six-weeks fescue	X	X	X	X	X	X	X	X	X	X	X	X

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Potamogetonaceae	**Pondweed Family**												
Potamogeton crispus	Crispate-leaved pondweed	X	X	X	X			X	X	X	X	X	X
Potamogeton foliosus	leafy pondweed	X	X	X	X	X	X	X	X	X	X	X	X
Potamogeton nodosus	long-leaved pondweed	X	X		X			X	X	X	X	X	
Potamogeton pectinatus	fennel-leaf pondweed	X	X	X	X	X	X	X	X	X	X	X	X
Ruppia maritima	ditch-grass							X	X	X	X	X	X
Typhaceae	**Cattail Family**												
Typha angustifolia	narrow-leaved cattail							X	X	X	X	X	
Typha domingensis	slender cattail	X	X	X	X	X	X	X	X	X	X	X	X
Typha latifolia	broad-leaved cattail	X	X	X	X	X	X	X	X	X	X	X	X
Zannichelliaceae	**Horned-Pondweed Family**												
Zannichellia palustris	horned pondweed	X	X	X	X	X	X	X	X	X	X	X	X
Zosteraceae	**Eel-Grass Family**												
Phyllospadix scouleri	surf-grass							X	X	X	X	X	
Phyllospadix torreyi	surf-grass							X	X	X	X	X	
Zostera marina	eel-grass							X	X	X	X	X	X

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	FISH		SIGNIFICANT ECOLOGICAL AREAS											
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	Gasterosteidae Family	**Stickleback Family**												
	Gasterosteus aculeatus aculeatus	fully armored three-spine stickleback						X						
	Gasterosteus aculeatus microcephalus	partly armored three-spine stickleback							X					
	Gasterosteus aculeatus williamsoni	unarmored three-spine stickleback			X									
	Ictaluridae Family	**Catfish Family**												
*	*Ictalurus nebulosus*	brown bullhead		X	X				X	X	X	X		
*	*Ictalurus punctatus*	channel catfish		X	X				X	X	X	X		
	Poeciliidae Family	**Livebearer Family**												
*	*Gambusia affinis*	mosquitofish	X	X	X	X	X	X	X	X	X	X	X	
	Cottidae Family	**Sculpin Family**												
	Cottus asper	prickly sculpin			X									
	Gobiidae Family	**Goby Family**												
	Eucyclogobius newberryi	tidewater goby							X					X
	Salmonidae Family	**Trout and Salmon Family**												
	Oncorhynchus mykiss iridius	steelhead rainbow trout							X					
	Oncorhynchus mykiss	rainbow trout		X				X	X	X	X	X		

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	Embiotocidae Family	**Surfperch Family**												
	Hysterocarpus traski	tuleperch		X										
	Centrarchidae Family	**Sunfish Family**												
*	*Micropterus salmoides*	largemouth bass		X	X			X	X	X	X	X		
*	*Lepomis macrochirus*	bluegill		X	X			X	X	X	X	X		
*	*Lepomis cyanellus*	green sunfish		X	X			X	X	X	X	X		
*	*Pomoxis annularis*	white crappie							X			X		
*	*Pomoxis nigromaculatus*	black crappie							X			X		
	Castostomidae Family	**Sucker Family**												
	Catostomus santaanae	Santa Ana sucker			X			X		X	X	X		
	Cyprinidae Family	**Minnow Family**												
*	*Cyprinus carpio*	carp								X	X	X		
*	*Notemigonus crysoleucas*	golden shiner			X									
*	*Pimephales promelas*	fathead minnow			X				X					
	Gila orcutti	arroyo chub		X	X			X	X	X	X			
	Rhinichthys osculus	speckled dace			X					X	X			

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Salamandridae	**Newts**												
Taricha torosa torosa	Coast Range newt			X		X	X	X	X	X		X	
Plethodontidae	**Lungless Salamanders**												
Ensatina eschscholtzi eschscholtzi	Monterey salamander	X	X	X		X	X	X	X	X		X	
Ensatina eschscholtzi crocreater	Yellow-blotched salamander								X	X			
Aneides lugubris	arboreal salamander	X	X	X		X	X	X	X	X	X	X	
Batrachoseps nigriventris	black-bellied slender salamander	X	X	X		X	X	X	X	X	X	X	
Batrachoseps pacificus	Pacific slender salamander						X	X	X	X	X	X	X
Batrachoseps pacificus major	garden slender salamander								X	X	X	X	
Batrachoseps stebbinsi	Tehachapi slender salamander		X										
Pelobatidae	**Spadefoot Toads**												
Spea hammondii	western spadefoot						X	X	X	X	X	X	
Bufonidae	**True Toads**												
Bufo boreas halophilus	California toad	X	X	X		X	X	X	X	X	X	X	
Bufo punctatus	red-spotted toad	X											
Bufo microscaphus californicus	Arroyo southwestern toad	X	X										
Hylidae	**Tree Frogs**												
Hyla cadaverina	California treefrog	X	X	X		X	X	X	X	X	X	X	
Hyla regilla	Pacific treefrog	X	X	X	X	X	X	X	X	X	X	X	X

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	AMPHIBIANS		SIGNIFICANT ECOLOGICAL AREAS											
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	Ranidae	**True Frogs**												
	Rana aurora draytonii	California red-legged frog			X				X					
	Rana boylii	Foothill yellow-legged frog		X						X	X			
	Rana muscosa	Mountain yellow-legged frog	X							X	X			
*	*Rana catesbeiana*	bullfrog	X	X	X	X	X	X	X	X	X	X	X	X
	Pipidae	**Tongueless Frogs**												
*	*Xenopus laevis*	African clawed frog	X	X	X		X	X	X	X	X	X	X	X

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Emydidae	**Box and Water Turtles**												
Clemmys marmorata pallida	southwestern pond turtle	X	X	X		X	X	X	X	X	X	X	
Testudinidae	**Land Tortoises**												
Gopherus agassizii	desert tortoise	X											
Gekkonidae	**Geckos**												
Coleonyx variegatus abbotti	San Diego banded gecko	X		X		X	X	X	X	X	X	X	
Iguanidae	**Iguanid Lizards**												
Dipsosaurus dorsalis	desert iguana	X											
Sceloporus magister uniformi	yellow-backed spiny lizard	X											
Gambelia wislizenii wislizenii	large-spotted leopard lizard	X											
Crotaphytus insularis bicinctores	Great Basin collared lizard	X											
Sauromalus obesus obesus	western chuckwalla	X											
Callisaurus draconoides draconoides	common zebra-tailed lizard	X											
Uma scoparia	Mojave fringe-toed lizard	X											
Sceloporus occidentalis biseriatus	Great Basin fence lizard	X	X	X	X	X	X	X	X	X	X	X	
Sceloporus graciosus vandenburgianus	southern sagebrush lizard	X	X										
Uta stansburiana	side-blotched lizard		X	X	X	X	X	X	X	X	X	X	
Urosaurus graciosus graciosus	western brush lizard	X											
Phrynosoma coronatum blainvillei	San Diego coast horned lizard	X		X		X	X	X	X	X	X	X	

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Phrynosoma coronatum frontale	California horned lizard	X	X	X	X		X	X	X	X		X	
Phrynosoma platyrhinos calidiarum	southern desert horned lizard	X											
Xantusiidae	**Night Lizards**												
Xantusia vigilis vigilis	common night lizard	X					X						
Xantusia riversiana	island night lizard												X
Scincidae	**Skinks**												
Eumeces skiltonianus skiltonianus	Skilton skink			X			X	X	X	X		X	
Eumeces gilberti rubricaudatus	western red-tailed skink						X	X	X	X			
Teiidae	**Whiptail Lizards**												
Cnemidophorus tigris tigris	Great Basin whiptail	X											
Cnemidophorus tigris multiscutatus	Coastal whiptail		X	X	X	X	X	X	X	X	X	X	
Anguidae	**Alligator Lizards**												
Elgaria multicarinatus webbi	San Diego alligator lizard		X	X			X	X	X	X	X	X	
Anniellidae	**California Legless Lizards**												
Anniella pulchra pulchra	silvery legless lizard		X	X			X	X	X	X	X	X	
Leptotyphlopidae	**Slender Blind Snakes**												
Leptotyphlops humilis	western blind snake	X	X	X	X	X	X	X	X	X	X	X	
Boidae	**Boas**												
Charina bottae umbratica	southern rubber boa		X										

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Lichanura trivirgata gracia	desert rosy boa	X			X								
Lichanura trivirgata roseofusca	Coastal rosy boa		X	X			X	X	X	X		X	
Colubridae	**Colubrid Snakes**												
Diadophis punctatus modestus	San Bernardino ringneck snake			X			X	X	X	X	X	X	X
Diadophis punctatus similis	San Diego ringneck snake											X	X
Phyllorhynchus decurtatus perkinsi	western spotted leaf-nosed snake	X							X	X			
Coluber constrictor mormon	western yellow-bellied racer		X	X				X					
Masticophis flagellum piceus	red coachwhip	X	X	X	X	X	X	X	X	X	X	X	
Masticophis lateralis lateralis	Chaparral whipsnake	X	X	X			X	X	X	X	X	X	
Salvadora hexalepis virgultea	Coast patch-nosed snake		X	X	X	X	X	X	X	X		X	
Arizona elegans occidentalis	California glossy snake											X	
Pituophis cantenifer annectens	San Diego gopher snake		X	X			X	X	X	X	X	X	
Pitouphis cantenifer deserticola	Great Basin gopher snake	X			X								
Lampropeltis getula californiae	California kingsnake	X	X	X	X	X	X	X	X	X	X	X	
Lampropeltis zonata parvirubra	San Bernardino Mountain kingsnake						X		X	X			
Lampropeltis zonata pulchra	San Diego Mountain kingsnake							X					
Rhinocheilus lecontei lecontei	western long-nosed snake	X	X	X	X	X	X	X	X	X	X	X	
Thamnophis sirtalis infernalis	California red-sided garter snake			X			X	X					
Thamnophis hammondii	two-striped garter snake	X	X	X		X	X	X	X	X			X

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Chionactis occipitalis occipitalis	Mojave shovel-nosed snake	X											
Tantilla planiceps	California black-headed snake			X			X	X				X	
Trimorphodon biscutatus vandenburghi	California lyre snake	X	X	X			X	X	X	X			
Hypsiglena torquata	night snake	X	X	X	X	X	X	X	X	X	X	X	
Viperidae	**Vipers**												
Crotalus ruber ruber	northern red diamond rattlesnake											X	
Crotalus mitchellii pyrrhus	southwestern speckled rattlesnake	X							X	X			
Crotalus cerastes cerastes	Mojave Desert sidewinder	X											
Crotalus scutulatus scutalatus	Mojave green rattlesnake	X											
Crotalus viridis helleri	southern pacific rattlesnake		X	X			X	X	X	X	X	X	

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Gaviidae	**Loons**												
Gavia stellata	red-throated loon												X
Gavia arctica	Pacific loon												X
Gavia immer	common loon												X
Podicipedidae	**Grebes**												
Podilymbus podiceps	pied-billed grebe		X					X			X		X
Podiceps auritus	horned grebe		X					X			X		X
Podiceps nigricollis	eared grebe		X					X			X		X
Aechmophorus clarkii	Clark's grebe		X					X			X		X
Aechmophorus occidentalis	western grebe		X					X			X		X
Pelecanidae	**Pelicans**												
Pelecanus erythrorhynchos	American white pelican	X											X
Pelecanus occidentalis californicus	California brown pelican							X			X		X
Phalacrocoracidae	**Cormorants**												
Phalacrocorax auritus	double-crested cormorant	X	X					X	X	X	X		X
Phalacrocorax penicillatus	Brandt's cormorant												X
Phalacrocorax pelagicus	pelagic cormorant												X

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Ardeidae	**Herons**												
Botaurus lentiginosus	American bittern	X	X				X	X	X	X	X		
Ixobrychus exilis hesperis	western least bittern	X	X	X				X	X	X	X		
Ardea herodias	great blue heron	X	X	X			X	X	X	X	X	X	X
Ardea alba	great egret	X	X	X			X	X	X	X	X	X	X
Egretta thula	snowy egret	X	X	X			X	X	X	X	X	X	X
Bubulcus ibis	cattle egret	X	X	X			X	X	X	X	X	X	X
Butorides striatus	green heron	X	X	X			X	X	X	X	X		X
Nycticorax nycticorax	black-crowned night-heron	X	X	X			X	X	X	X	X		X
Threskiornithidae	**Ibises**												
Plegadis chihi	white-faced ibis	X						X	X	X	X		
Anatidae	**Waterfowl**												
Anser albifrons	greater white-fronted goose	X		X				X			X		
Branta bernicla	brant	X						X			X		
Branta canadensis	Canada goose	X	X	X			X	X	X	X	X	X	X
Chen caerulescens	snow goose	X		X				X			X		
Aix sponsa	wood duck			X				X			X		
Anas crecca	green-winged teal	X	X	X			X	X	X	X	X	X	X
Anas platyrhynchos	mallard	X	X	X			X	X	X	X	X	X	X

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Anas acuta	northern pintail	X	X	X			X	X	X	X	X	X	X
Anas discors	blue-winged teal	X	X	X			X	X	X	X	X	X	X
Anas cyanoptera	cinnamon teal	X	X	X			X	X	X	X	X	X	X
Anas clypeata	northern shoveler	X	X	X			X	X	X	X	X	X	X
Anas strepera	gadwall	X	X	X			X	X	X	X	X	X	X
Anas americana	American wigeon	X	X	X			X	X	X	X	X	X	X
Anas penelope	Eurasian wigeon	X	X	X			X	X	X	X	X	X	X
Aythya valisineria	canvasback	X	X	X				X	X	X	X		
Aythya americana	redhead	X	X	X			X	X	X	X	X	X	X
Aythya collaris	ring-necked duck	X	X	X			X	X	X	X	X	X	X
Aythya marila	greater scaup		X					X					X
Aythya affinis	lesser scaup		X					X					
Melanitta nigra	black scoter							X					X
Melanitta perspicillata	surf scoter							X					X
Melanitta fusca	white-winged scoter							X					X
Bucephala clangula	common goldeneye	X	X	X			X	X	X	X	X	X	X
Bucephala albeola	bufflehead	X	X	X			X	X	X	X	X	X	X
Lophodytes cucullatus	hooded merganser		X					X			X		X
Mergus merganser	common merganser		X					X			X		X

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Mergus serrator	red-breasted merganser												X
Oxyura jamaicensis	ruddy duck	X	X	X			X	X	X	X	X	X	X
Cathartidae	**New World Vultures**												
Cathartes aura	turkey vulture	X	X	X	X	X	X	X	X	X	X	X	X
Gymnogyps californicus	California condor		X										
Accipitridae	**Hawks**												
Elanus leucurus	white-tailed kite	X	X	X		X	X	X	X	X	X	X	X
Pandion haliaetus	osprey	X	X	X			X		X	X	X		X
Haliaeetus leucocephalus	bald eagle	X	X					X	X	X	X		X
Circus cyaneus	northern harrier	X	X	X	X	X	X	X	X	X	X	X	X
Accipiter striatus	sharp-shinned hawk		X	X	X		X	X	X	X	X	X	X
Accipiter cooperii	Cooper's hawk		X	X	X		X	X	X	X	X	X	X
Accipiter gentilis	northern goshawk		X						X	X	X		
Buteo lineatus	red-shouldered hawk		X	X			X	X			X	X	X
Buteo swainsoni	Swainson's hawk	X	X	X	X		X	X	X	X		X	
Buteo jamaicensis	red-tailed hawk	X	X	X	X		X	X	X	X	X	X	
Buteo regalis	ferruginous hawk	X	X	X	X		X				X	X	
Buteo lagopus	rough-legged hawk	X			X			X					
Aquila chrysaetos	golden eagle	X	X	X	X	X	X	X	X	X	X	X	

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	Falconidae	**Falcons**												
	Falco sparverius	American kestrel	X	X	X	X	X	X	X	X	X	X	X	
	Falco columbarius	merlin	X	X	X			X	X	X	X	X	X	
	Falco mexicanus	prairie falcon	X	X	X	X	X	X	X	X	X	X	X	
	Falco peregrinus anatum	American peregrine falcon	X	X	X				X	X	X			X
	Phasianidae	**Pheasants and Quails**												
*	*Phasianus colchicus*	ring-necked pheasant		X										
	Callipepla californica	California quail	X	X	X	X	X	X	X	X	X	X	X	
	Oreortyx pictus	mountain quail		X				X		X	X			
	Rallidae	**Rails and Gallinules**												
	Rallus longirostris leripes	light-footed clapper rail			X				X					
	Rallus limicola	Virginia rail		X	X			X	X					
	Porzana carolina	sora		X	X			X	X					X
	Gallinula chloropus	common moorhen	X	X	X			X	X	X	X	X		X
	Fulica americana	American coot	X	X	X			X	X			X		X
	Charadriidae	**Plovers**												
	Pluvialis squatarola	black-bellied plover	X	X					X					X
	Charadrius alexandrinus nivosus	western snowy plover	X						X					X
	Charadrius montanus	mountain plover	X	X										

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Charadrius semipalmatus	semipalmated plover							X					X
Charadrius vociferus	killdeer	X	X	X	X	X	X	X	X	X	X	X	X
Haematopodidae	**Oystercatchers**												
Haematopus bachmani	black oystercatcher							X					X
Recurvirostridae	**Stilts and Avocets**												
Himantopus mexicanus	black-necked stilt	X					X	X	X	X	X		X
Recurvirostra americana	American avocet	X					X	X	X	X	X		X
Scolopacidae	**Sandpipers**												
Tringa melanoleuca	greater yellowlegs		X				X	X					X
Tringa flavipes	lesser yellowlegs		X				X	X					X
Catoptrophorus semipalmatus	willet												X
Heteroscelus incanus	wandering tattler												X
Actitis macularia	spotted sandpiper	X	X	X			X	X	X	X			X
Numenius phaeopus	whimbrel												X
Numenius americanus	long-billed curlew												X
Limosa fedoa	marbled godwit												X
Arenaria interpres	ruddy turnstone												X
Arenaria melanocephala	black turnstone												X
Aphriza virgata	surfbird												X

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Calidris canutus	red knot												X
Calidris alba	sanderling												X
Calidris mauri	western sandpiper												X
Calidris minutilla	least sandpiper												X
Calidris alpina	dunlin												X
Limnodromus griseus	short-billed dowitcher												X
Limnodromus scolopaceus	long-billed dowitcher												X
Gallinago gallinago	common snipe	X	X	X				X					X
Phalaropus tricolor	Wilson's phalarope												X
Phalaropus lobatus	red-necked phalarope												X
Laridae	**Gulls and Terns**												
Chidonias niger	black tern	X											
Larus philadelphia	Bonaparte's gull												X
Larus heermanni	Heermann's gull												X
Larus delawarensis	ring-billed gull	X						X	X	X	X	X	X
Larus californicus	California gull	X						X	X	X	X	X	X
Larus argentatus	herring gull	X						X	X	X	X	X	X
Larus occidentalis	western gull	X						X	X	X	X	X	X
Sterna caspia	Caspian tern							X					X

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	Sterna forsteri	Forster's tern							X					X
	Sterna antillarum browni	California least tern							X					
	Rynchops niger	black skimmer												X
	Alcidae	**Auks, Murres, and Puffins**												
	Uria aalge	common murre												X
	Synthliboramphus hypoleucus	Xamtus' murrelet												X
	Ptychoramphus aleuticus	Cassin's auklet												X
	Cerorhinca monocerata	Rhinoceros auklet												X
	Columbidae	**Pigeons and Doves**												
*	*Columba livia*	rock dove	X	X	X			X	X	X	X	X	X	X
	Columba fasciata	band-tailed		X	X			X	X				X	
*	*Streptopelia chinensis*	spotted dove										X		
	Zenaida macroura	mourning dove	X	X	X	X	X	X	X	X	X	X	X	X
	Columbina passerina	common ground-dove	X											
	Cuculidae	**Cuckoos and Roadrunners**												
	Geococcyx californianus	greater roadrunner	X		X			X	X				X	
	Tytonidae	**Barn Owls**												
	Tyto alba	barn owl		X	X			X	X	X	X	X	X	X

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Strigidae	**True Owls**												
Otus kennicottii	western screech-owl		X	X			X	X					
Bubo virginianus	great horned owl	X	X	X			X	X	X	X	X	X	X
Glaucidium gnoma	northern pygmy-owl						X						
Athene cunicularia hypugea	burrowing owl	X	X	X	X	X	X	X	X	X	X	X	X
Strix occidentalis occidentalis	spotted owl	X	X	X					X	X			
Asio flammeus	short-eared owl	X					X	X			X	X	X
Asio otus	long-eared owl	X	X	X			X	X	X	X	X	X	
Aegolius acadicus	northern saw-whet owl	X	X						X	X			
Caprimulgidae	**Goatsuckers**												
Chordeiles acutipennis	lesser nighthawk			X									
Chordeiles minor	common nighthawk		X				X	X	X	X			
Phalaenoptilus nuttallii	common poorwill	X	X	X			X	X	X	X	X		
Apodidae	**Swifts**												
Cypseloides niger	black swift							X	X	X			
Chaetura vauxi	Vaux's swift	X	X	X			X		X	X	X	X	
Aeronautes saxatalis	white-throated swift	X	X	X	X		X	X	X	X	X	X	X
Trochilidae	**Hummingbirds**												
Archilochus alexandri	black-chinned hummingbird		X	X			X	X	X	X	X	X	X

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Calypte annae	Anna's hummingbird		X	X			X	X	X	X	X	X	X
Calypte costae	Costa's hummingbird		X	X			X	X	X	X	X	X	X
Stellula calliope	Calliope hummingbird		X				X		X	X			
Selasphorus rufus	rufous hummingbird			X			X	X	X	X	X	X	
Selasphorus sasin	Allen's hummingbird			X			X	X	X	X	X	X	X
Alcedinidae	**Kingfishers**												
Ceryle alcyon	belted kingfisher		X	X			X	X	X	X			X
Picidae	**Woodpeckers**												
Melanerpes formicivorus	acorn woodpecker		X	X			X	X	X	X	X	X	X
Melanerpes lewisi	Lewis’s woodpecker		X				X						
Sphyrapicus ruber	red-breasted sapsucker			X			X	X				X	
Sphyrapicus thyroideus	Williamson’s sapsucker		X										
Picoides scalaris	ladder-backed woodpecker	X											
Picoides nuttallii	Nuttall's woodpecker		X	X			X	X	X	X		X	X
Picoides pubescens	downy woodpecker		X	X			X	X	X	X		X	X
Picoides villosus	hairy woodpecker		X	X			X	X	X	X		X	X
Colaptes auratus	northern flicker	X	X	X	X	X	X	X	X	X		X	X
Tyrannidae	**Tyrant Flycatchers**												
Contopus cooperi	olive-sided flycatcher		X	X			X	X	X	X		X	

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Contopus sordidulus	western wood-pewee		X	X			X	X	X	X		X	
Empidonax wrightii	gray flycatcher			X									
Empidonax traillii ssp.	willow flycatcher	X	X						X	X	X	X	
Empidonax traillii extimus	southwestern willow flycatcher		X	X			X	X	X	X	X	X	
Empidonax oberholseri	dusky flycatcher			X									
Empidonax hammondii	Hammond's flycatcher			X									
Empidonax difficilis	Pacific-slope flycatcher		X	X			X	X	X	X	X	X	
Emidonax traillis brewsteri	little willow flycatcher	X	X										
Pyrocephalus rubinus	vermillion flycatcher						X						
Sayornis nigricans	black phoebe	X	X	X			X	X	X	X	X	X	X
Sayornis saya	Say's phoebe			X			X	X				X	
Myiarchus cinerascens	ash-throated flycatcher	X	X	X	X	X	X	X	X	X	X	X	X
Tyrannus vociferans	Cassin's kingbird	X	X	X	X	X	X	X	X	X	X	X	
Tyrannus verticalis	western kingbird	X	X	X	X	X	X	X	X	X	X	X	
Alaudidae	**Larks**												
Eremophila alpestris actia	horned lark	X		X	X		X	X	X	X	X	X	
Hirundinidae	**Swallows**												
Progne subis	purple martin						X	X	X	X	X	X	
Tachycineta bicolor	tree swallow			X			X					X	

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Tachycineta thalassina	violet-green swallow		X	X			X	X	X	X	X	X	X
Stelgidopteryx serripennis	northern rough-winged swallow		X	X			X	X	X	X	X	X	X
Petrochelidon pyrrhonota	cliff swallow		X	X			X	X	X	X	X	X	X
Hirundo rustica	barn swallow		X	X			X	X	X	X	X	X	
Riparia riparia	bank swallow	X						X	X	X			
Corvidae	**Jays and Crows**												
Cyanocitta stelleri	Steller's jay		X						X	X			
Aphelocoma californica	western scrub-jay		X	X			X	X	X	X	X	X	X
Gymnorhinus cyanocephalus	Pinyon jay		X										
Corvus brachyrhynchos	American crow		X	X			X	X	X	X	X	X	
Corvus corax	common raven	X	X	X	X	X	X	X	X	X	X	X	X
Paridae	**Titmice**												
Poecile gambeli	mountain chickadee		X						X	X			
Baeolophus inornatus	oak titmouse		X	X			X	X	X	X	X	X	
Remizidae	**Verdins**												
Auriparus flaviceps	verdin	X											
Aegithalidae	**Bushtits**												
Psaltriparus minimus	bushtit	X	X	X	X	X	X	X	X	X	X	X	X

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Sittidae	**Nuthatches**												
Sitta canadensis	red-breasted nuthatch		X										
Sitta carolinensis	white-breasted nuthatch		X	X			X	X	X	X		X	
Sitta pygmaea	pygmy nuthatch		X										
Certhiidae	**Creepers**												
Certhia americana	brown creeper		X	X					X	X			
Troglodytidae	**Wrens**												
Campylorhynchus brunneicapillus couesi	coastal cactus wren							X	X	X	X	X	
Salpinctes obsoletus	rock wren	X	X	X			X	X	X	X			
Catherpes mexicanus	canyon wren		X	X			X	X	X	X			
Thryomanes bewickii	Bewick's wren		X	X			X	X	X	X	X	X	
Thryomanes bewickii catalinae	Catalina Bewick's wren												X
Troglodytes aedon	house wren		X	X			X	X	X	X	X	X	
Cistothorus palustris	marsh wren		X	X			X	X			X		
Cinclidae	**Dippers**												
Cinclus mexicanus	American dipper		X										
Regulidae	**Kinglets**												
Regulus satrapa	golden-crowned kinglet	X	X	X			X	X				X	
Regulus calendula	ruby-crowned kinglet	X	X	X			X	X			X	X	X

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Sylvidae	**Old World Warblers, Gnatcatchers**												
Polioptila caerulea	blue-gray gnatcatcher			X			X	X				X	
Polioptila californica californica	coastal California gnatcatcher			X		X	X	X	X	X	X	X	
Turdidae	**Thrushes**												
Myadestes townsendi	Townsend's solitaire		X										
Catharus ustulatus	Swainson's thrush		X	X			X	X	X	X		X	X
Catharus guttatus	hermit thrush		X	X			X	X	X	X		X	X
Turdus migratorius	American robin		X	X			X	X	X	X		X	X
Ixoreus naevius	varied thrush							X					
Sialia currucoides	mountain bluebird		X						X	X			
Sialia mexicana	western bluebird		X	X			X	X	X	X	X	X	X
Muscicapidae	**Wrentits**												
Chamaea fasciata	wrentit		X	X			X	X	X	X	X	X	X
Mimidae	**Thrashers**												
Mimus polyglottos	northern mockingbird	X	X	X	X	X	X	X	X	X	X	X	X
Toxostoma crissale	Crissal thrasher	X											
Toxostoma lecontei	Le Conte’s thrasher	X	X		X								
Toxostoma redivivum	California thrasher	X	X	X	X		X	X	X	X	X	X	

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	Motacillidae	**Pipits**												
	Anthus rubescens	American pipit		X	X			X	X	X	X	X	X	
	Bombycillidae	**Waxwings**												
	Bombycilla cedrorum	cedar waxing		X	X			X	X	X	X	X	X	
	Ptilogonatidae	**Silky Flycatchers**												
	Phainopepla nitens	phainopepla	X	X	X	X		X	X	X	X	X	X	
	Laniidae	**Shrikes**												
	Lanius ludovicianus	loggerhead shrike	X	X	X	X	X	X	X	X	X	X	X	X
	Sturnidae	**Starlings**												
*	*Sturnus vulgaris*	European starling	X	X	X	X	X	X	X	X	X	X	X	
	Vireonidae	**Vireos**												
	Vireo bellii pusillus	least Bell's vireo		X	X			X	X	X	X	X	X	
	Vireo cassini	Cassin's vireo						X	X				X	
	Vireo huttoni	Hutton's vireo						X	X			X	X	
	Vireo gilvus	warbling vireo		X	X			X	X			X	X	
	Vireo vicinior	gray vireo	X	X				X						
	Porulidae	**Wood Warblers**												
	Vermivora celata	orange-crowned warbler			X			X	X				X	
	Vermivora peregrina	Tennessee warbler						X						

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Vermivora ruficapilla	Nashville warbler			X			X	X				X	
Vermivora virginae	Virginia warbler		X		X		X		X	X			
Dendroica petechia brewsteri	yellow warbler		X	X			X	X	X	X	X	X	X
Dendroica coronata	yellow-rumped warbler	X	X	X	X		X	X			X	X	
Dendroica nigrescens	black-throated gray warbler			X			X	X				X	
Dendroica townsendi	Townsend's warbler			X			X	X				X	
Dendroica occidentalis	hermit warbler			X			X	X				X	
Oporornis tolmiei	MacGillivray's warbler			X			X	X				X	
Geothlypis trichas	common yellowthroat	X	X	X			X	X	X	X	X	X	
Wilsonia pusilla	Wilson's warbler			X			X	X				X	
Icteria virens	yellow-breasted chat		X	X			X		X	X	X	X	X
Cardinalidae	**Cardinals**												
Pheucticus melanocephalus	black-headed grosbeak			X			X	X				X	
Guiraca caerulea	blue grosbeak		X	X			X				X	X	X
Passerina amoena	lazuli bunting		X	X			X	X			X	X	X
Thraupidae	**Tanagers**												
Piranga rubra	summer tanager			X			X	X	X	X			
Piranga ludoviciana	western tanager			X			X	X				X	

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Emberizidae	**Emberizids**												
Pipilo chlorurus	green-tailed towhee	X	X						X	X			
Pipilo crissalis	California towhee			X			X	X				X	X
Pipilo maculatus	spotted towhee		X	X			X	X	X	X	X	X	
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow		X	X		X	X	X	X	X	X	X	X
Spizella passerina	chipping sparrow			X			X					X	
Spizella breweri	Brewer's sparrow						X						
Spizella atrogularis	black-chinned sparrow						X					X	
Pooecetes gramineus	vesper sparrow			X									
Chondestes grammacus	lark sparrow			X			X	X				X	
Amphispiza bilineata	black-throated sparrow		X				X						
Amphispiza belli	sage sparrow						X					X	
Amphispiza belli belli	Bell’s sage sparrow		X	X	X	X	X	X	X	X		X	
Passerculus sandwichensis	savannah sparrow			X								X	
Passerculus sandwichensis beldingi	Belding’s savannah sparrow							X					
Ammodramus savannarum	grasshopper sparrow	X											
Passerella iliaca	fox sparrow			X			X	X				X	
Melospiza melodia	song sparrow		X	X			X	X	X	X	X	X	

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Melospiza lincolnii	Lincoln's sparrow			X			X	X				X	
Zonotrichia atricopilla	golden-crowned sparrow			X			X	X				X	
Zonotrichia leucophrys	white-crowned sparrow		X	X			X	X	X	X	X	X	
Zonotrichia querula	Harris' sparrow						X						
Junco hyemalis	dark-eyed junco		X	X			X	X			X	X	
Icteridox	**Blackbirds**												
Agelaius phoeniceus	red-winged blackbird	X	X	X			X	X	X	X	X	X	X
Agelaius tricolor	tricolored blackbird	X	X	X			X	X	X	X	X		
Sturnella neglecta	western meadowlark		X	X			X	X	X	X	X	X	X
Xanthocephalus xanthocephalus	yellow-headed blackbird		X				X						
Euphagus cyanocephalus	Brewer's blackbird		X	X			X	X			X	X	X
Quiscalus mexicanus	great-tailed grackle								X	X	X		
Molothrus ater	brown-headed cowbird		X	X			X	X	X	X	X	X	X
Icterus bullockii	Bullock's oriole		X	X			X	X	X	X	X	X	X
Icterus cucullatus	hooded oriole		X	X			X	X	X	X	X	X	X
Icterus parisorum	Scott's oriole	X			X								
Fringillidae	**Finches**												
Carpodacus purpureus	purple finch			X			X					X	
Carpodacus cassinii	Cassin's finch		X	X			X		X	X	X		

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	Carpodacus mexicanus	house finch	X	X	X	X	X	X	X	X	X	X	X	X
	Loxia curvirostra	red crossbill		X										
	Carduelis pinus	pine siskin	X	X	X			X	X	X	X	X	X	
	Carduelis psaltria	lesser goldfinch		X	X			X	X	X	X	X	X	X
	Carduelis lawrencei	Lawrence's goldfinch			X			X	X				X	
	Carduelis tristis	American goldfinch	X	X	X			X	X	X	X	X	X	X
	Passeridae	**Old World Sparrows**												
*	*Passer domesticus*	house sparrow	X	X	X	X	X	X	X	X	X	X	X	X

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	Didelphidae	**New World Opossums**												
*	*Didelphis virginiana*	Virginia opossum	X	X	X	X	X	X	X	X	X	X	X	
	Soricidae	**Shrews**												
	Sorex ornatus	ornate shrew			X			X	X				X	
	Sorex ornatus willetti	Santa Catalina shrew												X
	Notiosorex crawfordi	desert shrew	X		X	X								
	Talpidae	**Moles**												
	Scapanus latimanus	broad-footed mole		X	X		X	X		X	X	X	X	
	Scapanus latimanus occultus	broad-handed mole							X					
	Phyllostomidae	**Leaf-Nosed Bat Family**												
	Macrotus californicus	California leaf-nosed bat		X	X	X		X						
	Vespertilionidae	**Evening Bats**												
	Antrozous pallidus pacificus	pallid bat		X	X			X	X	X	X	X	X	X
	Corynorhinus (=Plecotus) townsendii pallescens	pale big-eared bat						X						X
	Myotis californicus californicus	California myotis			X			X	X				X	
	Myotis ciliolabrum	small-footed myotis								X	X			
	Myotis evotis evotis	long-eared myotis			X					X	X		X	
	Myotis leibii	small-footed myotis			X								X	
	Myotis lucifugus	little brown myotis			X								X	

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MAMMALS		SIGNIFICANT ECOLOGICAL AREAS											
Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Myotis occultus (=Myotis lucifugus occultus)	occult little brown bat (AKA Arizona myotis)						X	X					
Myotis thysanodes	fringed myotis	X		X					X	X		X	
Myotis volans	long-legged myotis	X		X			X	X	X	X		X	
Myotis yumanensis	Yuma myotis (AKA San Joaquin myotis)		X	X			X	X	X	X		X	
Lasiurus borealis	red bat			X								X	
Lasiurus cinereus	hoary bat			X				X				X	
Lasiurus cinereus	hoary bat	X	X										
Pipistrellus hesperus	western pipistrelle			X			X	X				X	
Eptesicus fuscus	big brown bat			X			X	X				X	
Euderma maculatum	spotted bat		X	X	X		X	X					
Plecotus townsendii pallescens	Townsend's big-eared bat		X	X			X	X	X	X		X	
Corynorhinus (=Plecotus) townsendii townsendii	Townsend’s western big-eared bat	X	X				X	X	X	X		X	
Molossidae	**Free-Tailed Bats**												
Tadarida brasiliensis	Brazilian free-tailed bat			X								X	
Tadarida brasiliensis mexicana	guano bat						X	X					
Tadarida femorosacca	pocketed free-tailed bat			X								X	
Eumops perotis californicus	western mastiff bat		X	X	X		X	X	X	X	X	X	

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MAMMALS		SIGNIFICANT ECOLOGICAL AREAS											
Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Leporidae	**Hares and Rabbits**												
Lepus californicus bennettii	San Diego black-tailed jackrabbit			X			X	X	X	X	X	X	
Sylvilagus audubonii	desert cottontail			X			X					X	
Sylvilagus audubonii sanctdiegi	Audobon's cottontail						X	X					
Sylvilagus bachmani	brush rabbit			X			X	X				X	
Sciuridae	**Squirrels**												
Tamias merriami	Merriam's chipmunk		X				X						
Ammospermophilus leucurus	white-tailed antelope squirrel	X			X								
Spermophilus beecheyi nesioticus	California ground squirrel	X	X	X	X		X	X	X	X	X	X	
Spermophilus mohavensis	Mohave ground squirrel	X	X		X								
Sciurus griseus	western gray squirrel			X				X				X	
Geomyidae	**Pocket Gophers**												
Thomomys bottae	Botta's pocket gopher	X	X	X			X	X	X	X	X	X	
Heteromyidae	**Pocket Mice and Kangaroo Rats**												
Perognathus alticola inexpectatus	white-eared pocket mouse		X		X								
Perognathus inornatus inornatus	San Joaquin pocket mouse	X											
Perognathus longimembris brevinasus	Los Angeles pocket mouse			X			X	X	X	X	X	X	
Perognathus longimembris pacificus	Pacific little pocket mouse		X			X							
Chaetodipus californicus	California pocket mouse			X			X	X				X	

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MAMMALS		SIGNIFICANT ECOLOGICAL AREAS											
Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
Chaetodipus fallax	San Diego pocket mouse								X	X		X	
Chaetodipus penicillatus	desert pocket mouse	X											
Dipodomys agilis	Pacific kangaroo rat			X			X	X				X	
Dipodomys heermanni	Heermann's kangaroo rat						X						
Dipodomys merriami	Merriam's kangaroo rat								X	X			
Dipodomys merriami parvus	San Bernardino Merriam's kangaroo rat		X	X					X	X			
Muridae	**Mice, Rats, and Voles**												
Reithrodontomys megalotis	western harvest mouse			X				X				X	
Reithrodontomys megalotis catalinae	western harvest mouse						X						
Peromyscus boylei	brush mouse			X			X	X					
Peromyscus californicus	California mouse			X								X	
Peromyscus californicus insignis	California parasitic mouse						X	X					
Peromyscus crinitus	canyon mouse			X									
Peromyscus eremicus	cactus mouse							X				X	
Peromyscus maniculatus catalinae	deer mouse			X			X	X				X	
Peromyscus truei	pinon mouse						X						
Onychomys torridus ramonia	southern grasshopper mouse		X	X	X	X	X		X	X			
Neotoma fuscipes	dusky-footed woodrat			X			X	X				X	
Neotoma fuscipes riparia	riparian woodrat								X	X		X	X

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	Scientific Name	**Common Name**	**AV**	**SA**	**SC**	**JT**	**CM**	**SS**	**SM**	**SG**	**SD**	**ES**	**PH**	**CI**
	Neotoma lepida	desert woodrat	X											
	Neotoma lepida intermedia	San Diego desert woodrat	X	X	X	X		X	X	X	X	X	X	
*	*Rattus norvegicus*	Norway rat			X									
*	*Rattus rattus*	black rat			X									
*	*Mus musculus*	house mouse			X				X				X	
	Microtus californicus	California vole			X			X	X				X	
	Canidae	**Wolves and Foxes**												
	Canis latrans	coyote	X	X	X	X	X	X	X	X	X	X	X	X
	Vulpes velox	kit fox	X		X									
*	*Vulpes fulva*	red fox			X			X						
	Urocyon littoralis catalinae	island fox												X
	Urocyon cinereoargenteus	gray fox		X	X			X	X	X	X	X	X	
	Ursidae	**Bears**												
	Ursus americanus	black bear	X	X	X					X	X			
	Otariidae	**Eared Seals**												
	Zalophus californianus	California sea lion												X
	Phocidae	**Hair Seals**												
	Phoca vitulina	harbor seal												X
	Mirounga angustirostris	northern elephant seal												X

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	Procyonidae	**Raccoons**												
	Bassariscus astutus octarus	ringtail cat		X	X			X	X	X	X			
	Procyon lotor	raccoon	X	X	X	X	X	X	X	X	X	X	X	
	Mustelidae	**Weasels, Skunks, and Otters**												
	Mustela frenata	long-tailed weasel		X	X			X	X	X	X		X	
	Taxidea taxus	American badger		X	X			X	X	X	X		X	
	Spilogale gracilis	western spotted skunk	X	X	X			X	X	X	X		X	
	Mephitis mephitis	striped skunk	X	X	X	X	X	X	X	X	X	X	X	
	Felidae	**Cats**												
	Felis concolor	mountain lion		X	X			X	X	X	X		X	
	Felis rufus	bobcat		X	X			X	X	X	X		X	
	Suidae	**Pigs**												
*	*Sus scrofa*	wild pig		X										
	Cervidae	**Deer**												
	Odocoileus hemionus	mule deer	X	X	X	X		X	X	X	X	X	X	
	Bovidae	**Bison, Goats, and Sheep**												
	Capra hircus	goat												X
	Ovis canadensis	bighorn sheep								X	X			
	Bison bison	bison												X

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Appendix H6
South Coast Missing Linkages: A Wildland Network for the South Coast Ecoregion

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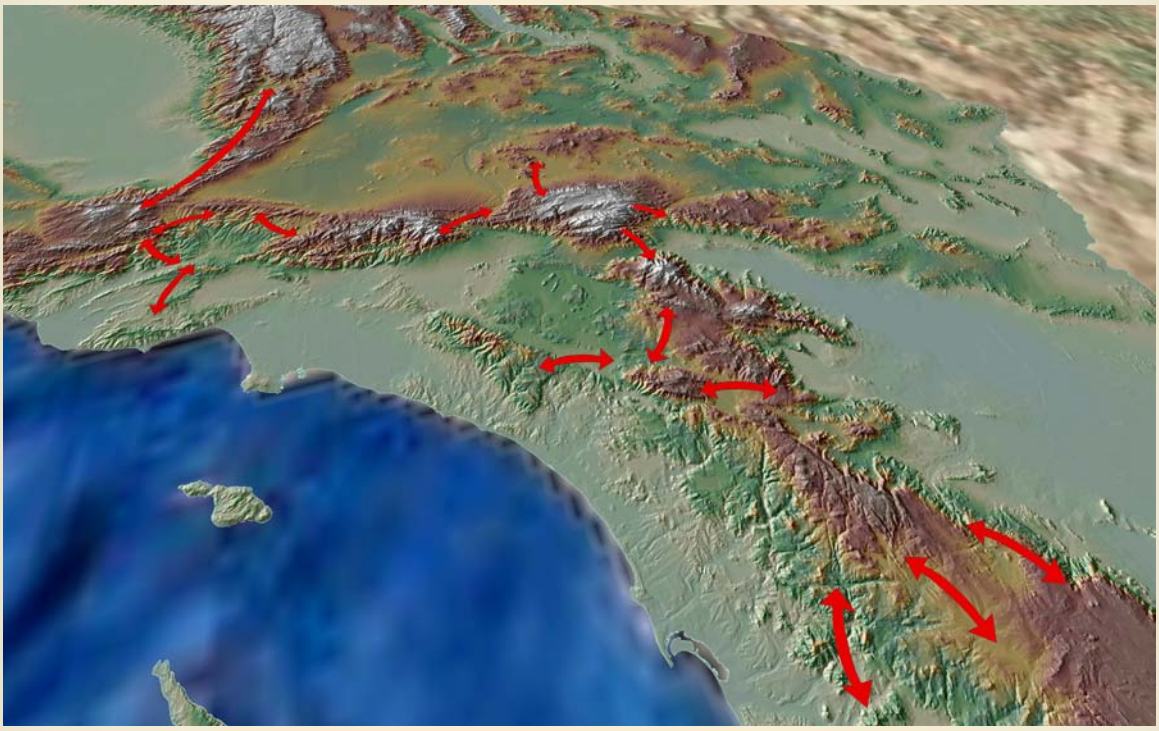
South Coast Missing Linkages:

A Wildland Network for the South Coast Ecoregion





South Coast Wildlands

Produced by South Coast Wildlands: Our Mission is to protect and restore systems of connected wildlands that support native wildlife and the ecosystems upon which they rely.

Project Partners: We would like to recognize our partners on the South Coast Missing Linkages Project, including The Wildlands Conservancy, The Resources Agency, U.S. Forest Service, California State Parks, California State Parks Foundation, National Park Service, San Diego State University Field Stations Program, Environment Now, The Nature Conservancy, Conservation Biology Institute, Santa Monica Mountains Conservancy, Wetlands Recovery Project, Mountain Lion Foundation, Rivers and Mountains Conservancy, California Wilderness Coalition, Wildlands Project, Zoological Society of San Diego Center for Reproduction of Endangered Species, Pronatura, Conabio, and Universidad Autonoma de Baja California. We are committed to collaboration to secure a wildlands network for the South Coast Ecoregion and beyond and look forward to adding additional agencies and organizations to our list of partners.



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A. Conservation Planning Approach
B. South Coast Wildland Network, Existing Conservation Investments
C. Literature Cited

Executive Summary: A Network of Wildlands

Only a century ago, southern California was one vast wildland supporting a dazzling array of habitats and a veritable treasure trove of life. Creatures great and small, mobile and stationary – many found no where else on earth - thrived in these habitats. Grizzly bears dominated the landscape and mountain lions roamed from the mountains to the sea.

Much of this vast wildland has been lost to housing developments, freeways, and strip malls, with drastic impacts on the abundant plant and animal communities that flourished here. Yet, much of the unique vegetation and wildlife that dominated this pre-development landscape can still be found, and what remains can be maintained, despite the changes we've made and continue making to the landscape.

Habitat loss and fragmentation are the leading threats to biodiversity worldwide, and nowhere is the risk more severe than in southern California. Countering these threats requires protecting connections between our existing open space areas to form a regional wildland network. Such an interconnected set of reserves would allow natural ecological processes—such as migration and range shifts with climate change--to continue operating as they have for millennia.

The South Coast Missing Linkages project has developed a comprehensive plan for such a regional network that would maintain and restore critical habitat linkages between existing reserves. These linkages form the backbone of a conservation strategy for southern California where the whole would be greater than the sum of the parts. This strategy represents the best hope for maintaining what remains of southern California's wildlife legacy, while ensuring quality of life for our citizens via clean air, clean water, and recreational opportunities.



The South Coast Ecoregion encompasses roughly 8% of California and extends 190 miles into Baja.

South Coast Missing Linkages is a highly collaborative inter-agency effort to identify and conserve the highest-priority linkages in the South Coast Ecoregion. Partners include South Coast Wildlands, National Park Service, U.S. Forest Service, California State Parks, The Wildlands Conservancy, The Resources Agency, California State Parks Foundation, The Nature Conservancy, Santa Monica Mountains Conservancy, Resources Legacy Foundation, Conservation Biology Institute, San Diego State University Field Stations Program, Environment Now, Mountain Lion Foundation, and the Zoological Society of San Diego's Conservation and Research for Endangered Species, among others. Cross-border alliances have also been formed with Pronatura, Universidad Autonoma de Baja California, Terra Peninsular, and Conabio, in recognition of our shared vision for ecological connectivity across the border into Baja.

Nature Needs Room to Roam

Movement is essential to wildlife survival, whether it be the day-to-day movements of individuals seeking food, shelter, or mates, dispersal of offspring to find new homes, or seasonal migration to find favorable conditions. Movement is essential for gene flow, for recolonizing unoccupied habitat after a local population goes extinct, and for species to shift their geographic range in response to global climate change. Disruption of these natural movement patterns by roads, development, or other impediments can alter these essential ecosystem functions and lead to losses of species and critical environmental services.



Gerald and Buff Corsi
© CA Academy of Sciences

The tension between habitat fragmentation and conservation is particularly acute in southern California, one of 25 hotspots of biological diversity on Earth, and one of our nation's largest urban areas. It is also one of the most threatened areas, with over 400 species of plants and animals considered endangered, threatened or sensitive by government agencies and conservation groups. Existing reserves conserve many of these species, but wide-ranging species like mountain lions, badgers, and bighorn sheep may be lost from even the largest areas if highways and urbanization isolate each major wildland.



Gerald and Buff Corsi
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Despite a half-century of rapid habitat conversion, the South Coast Ecoregion retains valuable wildlands, and opportunities remain to conserve and restore a functional wildland network. The region's archipelago of conserved wildlands is fundamentally one interconnected system, and the goal of South Coast Missing Linkages is to keep it so. It is our hope that the South Coast Missing Linkages plan will serve as a catalyst for directing funds and attention toward the protection of ecological connectivity for the South Coast Ecoregion and beyond.



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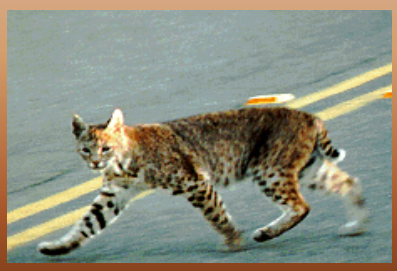
"Without connectivity, landscapes may be reduced to pathetic remnants that sustain few species and provide little ecological value."

E.O. Wilson

Impediments to Wildlife Movement

Impediments to wildlife movement include roads, railroads, dams, canals, urban development, and agriculture. Loss of connectivity is by no means inevitable, and development does not have to result in a proliferation of barriers to wildlife movement.

In our Ecoregion, roads and urbanization are the major obstacles to wildlife movement. Road effects extend far beyond the road itself and include road kill, disruption of animal movements, spread of exotic species, and increases in pollution, noise, light and fire in wildlife habitats. Roads can fragment large habitat areas into smaller patches that support smaller populations, which are consequently more prone to local extinction. Many of these effects can be mitigated and recommendations to do just that are an important component of our plan for restoring ecological connectivity to the South Coast Ecoregion.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Urban developments, unlike roads, create movement barriers that cannot be readily removed, restored, or mitigated. The impacts of urbanization include removal of native vegetation, spread of non-native vegetation, dogs and cats killing and harassing wildlife, artificial night lighting impeding night-time movement, pesticides, rodenticides, noise, disruption of fire regimes, pollution, conflicts with wild animals that eat domestic plants and animals, and altered patterns of water in streams and ponds.

Conservation Planning Approach

South Coast Missing Linkages incorporates advanced conservation planning techniques and the expertise of preeminent scientists. Our approach has been highly collaborative and interdisciplinary with participation by experts in biology, conservation design, and implementation in a reiterative process. This approach has yielded a strong biological foundation and a quantifiable, repeatable conservation design methodology (Appendix A, Conservation Planning Approach) that can be used as the basis for conservation action.

South Coast Missing Linkages developed the linkage designs based on inputs from a series of workshops at which 270 participants from 126 agencies, academic institutions, land managers, planners, conservation organizations, and community groups identified 109 focal species, including 26 plants, 25 insects, 4 fish, 5 amphibians, 12 reptiles, 20 birds and 17 mammals. These focal species cover a broad range of habitat and movement requirements such that planning adequate linkages for their needs is expected to cover connectivity needs for the ecosystems they represent. The linkage designs are based on state-of-the-art GIS analyses informed by experts on each focal species, and contain multiple strands to serve the needs of various species.

To identify potential routes between existing protected areas we conducted landscape permeability analyses for selected focal species for which appropriate data were available. Permeability analyses model the relative cost for a species to move between protected core habitat or population areas. We defined a least-cost corridor—or best potential route—for each species, and then combined these into a Least Cost Union. We then analyzed the size and configuration of suitable habitat patches within this Least Cost Union for all focal species to verify

that the final Linkage Design would suit the live-in or move-through habitat needs of all. Where the Least Cost Union omitted areas essential to the needs of a particular species, we expanded the Linkage Design to accommodate that species' particular requirements, and ensure that no species was left behind. We also visited priority areas in the field to identify and evaluate barriers to wildlife movement. We also suggest restoration strategies to mitigate those barriers, with special emphasis on opportunities to reduce the adverse effects of transportation barriers.

The resultant linkage designs are broad to 1) buffer against edge effects; 2) provide live-in habitat for species needing multiple generations to achieve gene flow through the linkage; 3) ensure availability of key resources; 4) allow natural processes to operate, and 5) allow species and natural communities to respond to climatic changes. A crucial element of each linkage design is a set of recommendations to mitigate barriers, restore habitats, and manage the linkage.



A Scientifically Sound Plan for Conservation Action

The South Coast Missing Linkages conservation plan addresses the challenges posed to our natural environment by the ever-increasing human footprint by seeking to influence regional development and land-management patterns in a manner that best preserves landscape level processes while accommodating economic development needs. We hope this linkage conservation plan will be used to protect an interconnected system of natural space where our native biodiversity can thrive at minimal cost to other human endeavors. For example, the plan can be used as a resource for regional land managers to guide how they can best help sustain biodiversity and ecosystem processes by implementing the linkage designs. Relevant aspects of the plan can be folded into management plans of agencies and organizations administering conservation lands in the region.

Transportation agencies can use the plan to design new projects and find opportunities to upgrade existing structures. Regulatory agencies can use this information to help inform decisions regarding impacts on streams and other habitats.

This report can also help motivate and inform construction of wildlife crossings, watershed planning, habitat restoration, conservation easements, zoning, and land acquisition. Implementing this plan will likely take decades, and will require collaboration among county planners, land and resource management agencies, transportation agencies, conservancies, and private landowners.

Public education and outreach are vital to the success of this effort – both to change land use activities that threaten wildlife

movement and to generate appreciation for the importance of the linkages and the wildland network they will sustain. The biological information, maps, figures, tables, and photographs in this plan are ready materials for interpretive programs. Public education can encourage residents at the urban-wildland interface to become active stewards of the land and generate a sense of place and ownership for local habitats and processes. Such voluntary cooperation is essential to preserving linkage function.



South Coast Wildland Network

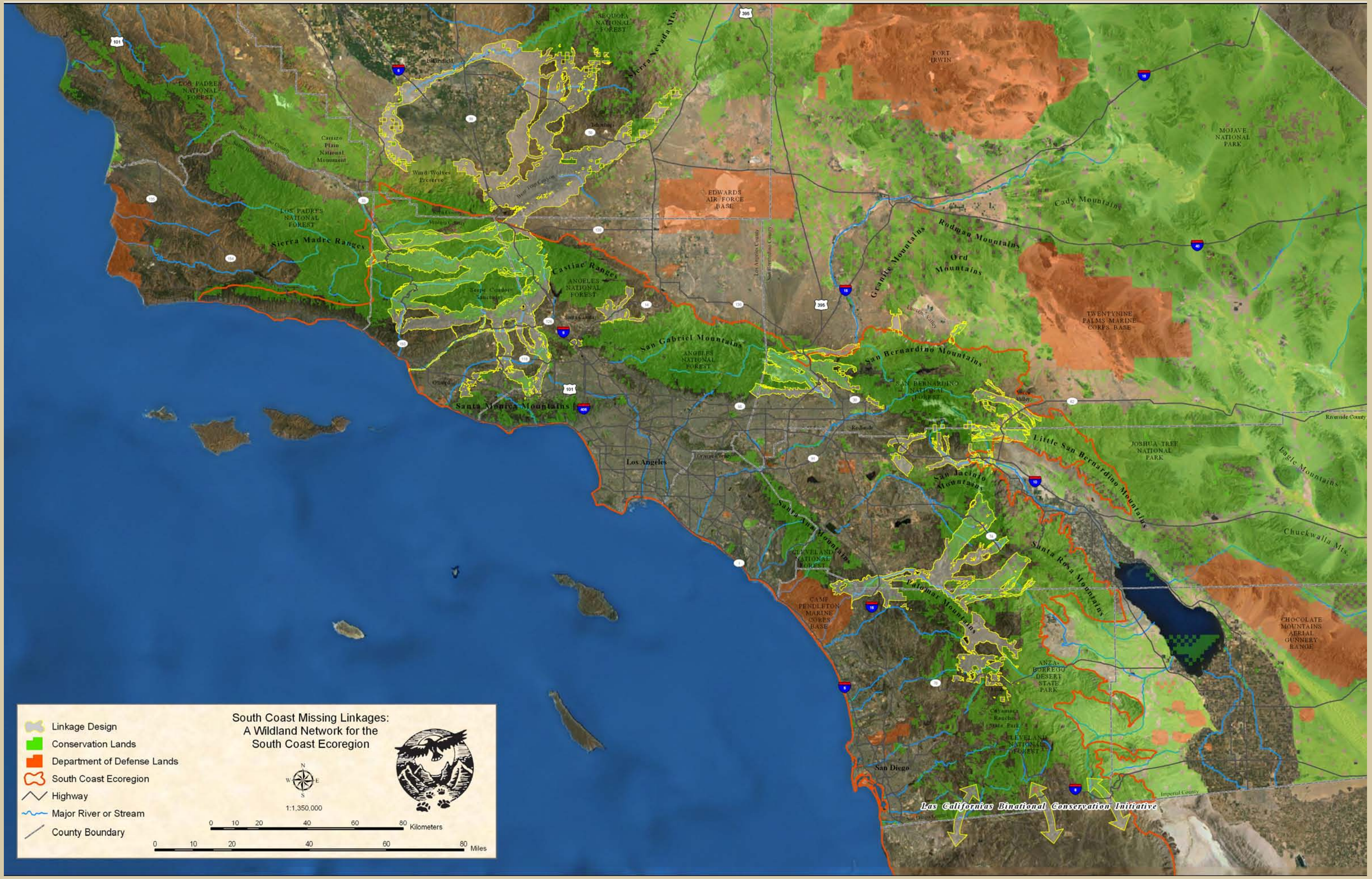
South Coast Missing Linkages has prioritized and designed landscape linkages that are widely considered the backbone of a conservation strategy for southern California. The linkages designed by South Coast Missing Linkages stitch together over 18 million acres of our existing conservation investments (national forests, state and national parks, etc.) to form the South Coast Wildland Network (Appendix B, Existing Conservation Investments). The network encompasses 19,435,105 acres (94% is already protected), maintaining connected wildlife populations from the southern Sierra Nevada to Baja California, and from the beaches of Camp Pendleton eastward to the deserts of Anza-Borrego Desert State Park. These critically important linkages must be secured if we are to maintain the region's tremendous biodiversity.

The ecological, educational, recreational, and spiritual values of protected wildlands in the South Coast Ecoregion are immense. These conserved lands also represent an investment of tens of billions of dollars. We need to ensure the ecological health of this investment by securing these linkages.

The linkages identified by South Coast Missing Linkages are key to the ultimate protection and restoration of a wildlands network where our native biodiversity can thrive. The unbroken chain of mountains and foothills created by the South Coast Wildland Network will allow wide-ranging species like the mountain lion to roam from the Sierra Nevada to the Sierra Juarez in Baja California Norte. The South Coast Wildland Network will also provide unparalleled recreational, educational, and spiritual opportunities for more than 17 million people who make southern California their home, while promoting the long-term health of the state's land, water and air.

The following section provides an overview of the critical linkages: where they lie on the landscape, what they connect and the species that use them. The descriptions also provide some recommendations for improving wildlife

movement in each linkage. For a complete description of what is required to conserve and improve functional habitat connectivity in each linkage, please see the full linkage reports available at www.scwildlands.org.


Linkage Design
Conservation Lands
Department of Defense Lands
South Coast Ecoregion
Highway
Major River or Stream
County Boundary
South Coast Missing Linkages:
A Wildland Network for the
South Coast Ecoregion
1:1,350,000
0 10 20 40 60 80 Kilometers
0 10 20 40 60 80 Miles
Las Californias Binational Conservation Initiative
Los Angeles
San Diego
Santa Monica Mountains
San Gabriel Mountains
San Bernardino Mountains
Little San Bernardino Mountains
Sierra Madre Ranges
Castiac Ranges
Sierra Nevada Mts.
Cady Mountains
Rodman Mountains
Ord Mountains
Granite Mountains
Eagle Mountains
Chuckwalla Mts.
Santa Rosa Mountains
Palomar Mountains
Santa Ana Mountains
San Jacinto Mountains
FORT IRWIN
EDWARDS AIR FORCE BASE
TWENTYNINE PALMS MARINE CORPS BASE
MOJAVE NATIONAL PARK
JOSHUA TREE NATIONAL PARK
CHOCOLATE MOUNTAINS AERIAL GUNNERY RANGE
CAMP PENDLETON MARINE CORPS BASE
ANZA-BORREGO DESERT STATE PARK
LOS PADRES NATIONAL FOREST
ANGELES NATIONAL FOREST
SAN BERNARDINO NATIONAL FOREST
CLEVELAND NATIONAL FOREST
SEQUOIA NATIONAL FOREST
Carrizo Plain National Monument
Wind Wolves Preserve
Sespe Condor Sanctuary
Bakersfield
Riverside County
Imperial County

Tehachapi Connection

This linkage has statewide importance as the sole wildland connection between the Sierra Nevada-Cascade system that stretches for over 2000 miles from Kern County into British Columbia, and the 800 mile long upland system comprised of the Sierra Madre (the coast ranges from San Francisco to Los Angeles), Transverse (Santa Monica, San Gabriel, San Bernardino, and San Jacintos Mountains), and Peninsular Ranges (Santa Ana, Palomar, and Laguna Mountains of San Diego County, and the Sierra Juarez of Baja). This linkage is also situated at the juncture of several ecoregions, including the Sierra Nevada, South Coast, Central Valley, and the Mojave Desert. The Tehachapis have been described as a "biogeographic crossroads" and a "crucible of evolution", and are home to a stunning variety of plant and animal life (White et al. 2003). As might be expected in this remarkable landscape, the Linkage Design encompasses a diversity of natural communities, including over 30 vegetation types. About 15% (102,355 out of 663,257 total acres) of the Linkage Design currently enjoys some level of conservation protection, mostly in land administered by the Bureau of Land Management.



Looking down Bear Trap Canyon in the Tehachapi Mountains toward the Sierra Madre Ranges, Los Padres National Forest (Photo Andrew Harvey, VisualJourneys.net).

The Linkage Design has four main strands, which tend to follow elevational contours that connect along areas of similar ecological conditions. One strand includes a swath of grassland and foothill habitats along the southern rim of the San Joaquin Valley to serve the suite of grassland-dependent species clinging to existence there, such as the endangered San Joaquin kit fox and blunt-nosed leopard lizard. A second strand connects a series of higher elevation forest and shrubland habitats serving species, such as puma, western gray squirrel, and mule deer. A third strand follows the desert-side slopes of the Tehachapis, connecting habitats for species, such as

the Tehachapi pocket mouse, that are restricted to the unique conditions of this biogeographic contact zone. These three major strands, or linkages, are clearly separated in the northeast where each connects into the Sierra Nevada, but they tend to fuse in the more geographically constrained southwestern portion of the study area, in the western Tehachapis. Some cross connections were included between these strands to serve the movement needs of species, such as the western pond turtle, that require aquatic and riparian habitats running perpendicular to the main contour-following linkages. The forth strand follows alluvial habitats along the Kern River across the San Joaquin Valley to connect alluvial grasslands and rare alkali habitats required by valley-floor species, such as the endangered Tipton kangaroo rat.

Interstate 5 and State Route 58 are the primary impediments to movement, with I-5 being the most substantial barrier. It bisects the southern part of the linkage and currently lacks adequate crossing structures. Given the continental importance of this linkage, we have identified four locations on I-5 and three locations on SR-58 at which first-class crossing structures should be located. At each of these locations, we recommend either a vegetated landbridge, or a bridged undercrossing large enough to allow natural vegetation to grow throughout the structure.

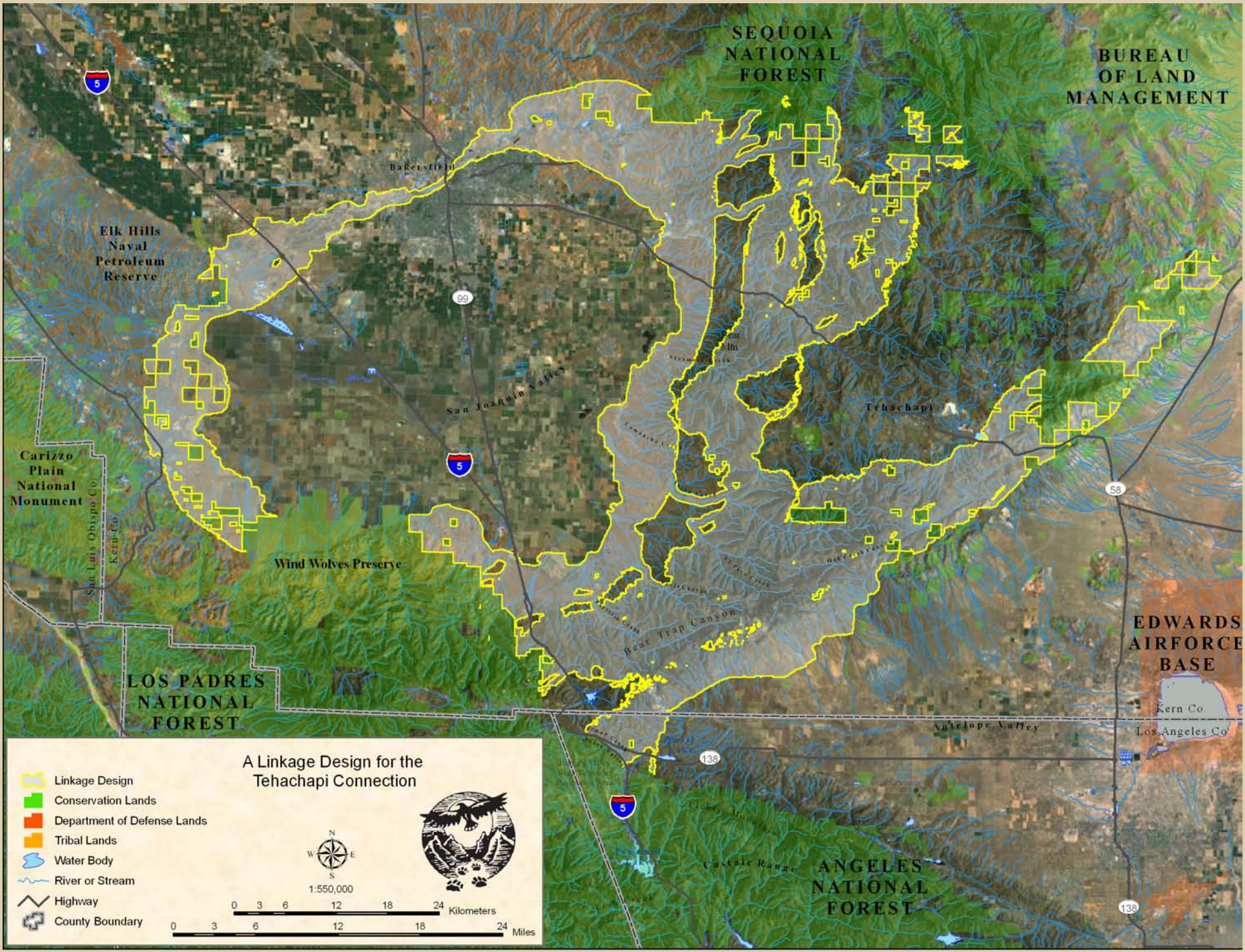
The top priority for a crossing structure on I-5 is where Grapevine Creek crosses I-5 just south of Ft. Tejon State Park and Tejon Ranch Headquarters. The least cost corridors for puma, mule deer, and western gray squirrel cross the freeway here, and appropriate habitats occur for numerous other species. Grapevine Creek now crosses I-5 in a small box culvert, which should be replaced with a large bridged undercrossing. To maximize the utility of Grapevine Creek as a movement area, we recommend removal of several buildings of the Tejon Ranch Headquarters (two administrative buildings, about a dozen homes, and an old school), and the associated mile of Lebec Road. The area vacated by these buildings should be restored to native vegetation.

Another priority area for improved crossing structures along I-5 is a 3-mile stretch south of the village of Gorman and north of the SR138 interchange. The least cost path of the Tehachapi pocket mouse crosses I-5 here, and suitable habitat occurs for several other focal species. The vegetation on the steep slopes appears to have been overgrazed and now lacks woody cover except in drainage bottoms; restoration or cessation of grazing domestic livestock would be needed. Four box culverts about 5 feet tall and wide are spaced one-half to 1 mile apart, and suggest locations for bridged undercrossings. Each culvert opens directly into Hungry Valley State Park on the west, and into Gorman Valley on the east. Alternatively, a vegetated land bridge may also be feasible in this area.



Culvert on Interstate-5 for Gorman Creek with Hungry Valley State Park in the foreground. Note steep degraded slopes on far side of I-5.

SR-58 is a 4-lane road with heavy traffic volumes. A concrete center divider runs almost continuously from the western foothills to the Tehachapi Creek Bridge at Keene, and again for another mile near Tehachapi. This barrier is about 5 ft tall from its west end to Bealville Road; elsewhere it is about 2.5 ft tall. The major feeder road to SR-58 in the western part of the linkage area (Bear Mountain Road SR-223) is a quiet country lane that is not a major impediment today. However, if lanes are added to SR-233, wildlife passage should be accommodated. Further east, SR-202 runs eastward from the city of Tehachapi into the agricultural but increasingly urban Cummings Valley and nearby residential developments of Stallion Springs and Bear Valley.


SEQUOIA NATIONAL FOREST
BUREAU OF LAND MANAGEMENT
Elk Hills Naval Petroleum Reserve
Bakersfield
99
San Joaquin Valley
Tehachapi
5
58
Carizzo Plain National Monument
San Luis Obispo Co
Kern Co
Wind Wolves Preserve
Bear Trap Canyon
EDWARDS AIRFORCE BASE
Kern Co
Los Angeles Co
LOS PADRES NATIONAL FOREST
Antelope Valley
138
Castaic Range
ANGELES NATIONAL FOREST
A Linkage Design for the Tehachapi Connection
Linkage Design
Conservation Lands
Department of Defense Lands
Tribal Lands
Water Body
River or Stream
Highway
County Boundary
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1:550,000
0 3 6 12 18 24 Kilometers
0 3 6 12 18 24 Miles

We recommend first-class crossing structures (canyon-spanning bridges, or vegetated overcrossings) in three areas along SR-58. The first area is in the grasslands near the San Joaquin Valley floor, between the 900-ft and 1400-ft elevation contours. The least cost corridors for blunt-nosed leopard lizard, San Joaquin kit fox, and badger all lie in this 2.5-mile wide stretch of SR-58. The best location for an underpass is at the 1020-ft elevation contour, where the freeway now sits on a 40-ft fill slope that spans a small canyon. Replacing this fill slope with a bridge 40 ft above the canyon bottom and about 500 ft long would provide an excellent crossing opportunity. At the 1280-ft contour, there is a similar fill slope that provides another location for a bridge of similar dimensions. The lower elevation area was modeled as the best habitat for focal species, but habitat quality is high at both sites. There are no dwellings or significant infrastructure (besides the highway) in the area.



Fill slope along SR-58 that should be replaced with a bridge.

The second area we propose an improved crossing structure is in the oak woodlands between the Hart Flat Road interchange with SR-58 and the village of Keene. The least cost corridors for mule deer and western gray squirrel cross SR-58 here and the entire area is excellent mountain lion habitat. The best location for an underpass is at the 2440-ft contour, where the highway now sits on a 20-ft fill slope that should be replaced with a bridge. Alternatively, it may be possible to construct a vegetated overcrossing here.



Oak woodlands between Hart Flat Rd interchange with SR58 and Keene.

We also recommend maintaining the rural character of the landscape at the bridge over Tehachapi Creek. Although this bridge is an excellent crossing, it is not sufficient as the sole structure in the oak woodland belt for several reasons. First, it's on the periphery of the linkage. Second, the crossing structure contains a railroad and a 2-lane paved road. Finally, the wildland approaches to the underpass are steep slopes on both sides of the freeway. To the extent that animals tend to follow streams, an animal that descended the steep slope to reach the underpass may follow Tehachapi Creek east or west (village of Keene in both directions) rather than ascend the steep slope on the other side.



SR-58 bridge over Tehachapi Creek. The paved road connects the east and west portions of Keene.

The third area we recommend a crossing structure is in the transition between Mojave Desert, grassland, and woodland west of Tehachapi, where two bridges now span Sand Creek. The least cost corridors of Tehachapi pocket mouse, mule deer, and mountain lion all cross SR-58 here. Excellent bridges already exist. We recommend enhancement of riparian vegetation underneath the bridges and approaching them.



The north side of SR-58 at Sand Creek.

Santa Monica-Sierra Madre Connection

This linkage is one of the few coastal to inland connections remaining in the South Coast Ecoegion. It stretches from the rugged Santa Monica Mountains at the coast to the jagged peaks of the Santa Susana Mountains and the Sierra Madre Ranges of Los Padres National Forest. The Linkage Design includes substantial public ownership that protects natural habitats from development, with 34% (43,249 of 125,613 acres) of the linkage currently enjoying some level of conservation protection. The linkage is comprised of a rich mosaic of oak woodland, savanna, chaparral, coastal sage scrub, grasslands, and riparian forests and woodlands, and has several major strands to accommodate diverse species and ecosystem functions.



Looking toward the coast over the gently sloping Simi Hills and the rugged Santa Monica Mountains. Photo Credit: Andrew M. Harvey, VisualJourneys.net

For most species, U.S. Route 101 and State Routes (SR) 23, 118, and 126 are the most obvious barriers between core reserves in the Santa Monica and Sierra Madre mountains, while Interstate 5 (I-5) and SR-14 impede movement between the Santa Susana and San Gabriel Mountains. The 101 Freeway is the most substantial impediment to movement. Several existing structures facilitate various levels of animal movement across these freeways.

Liberty Canyon was delineated by the landscape permeability analysis for mule deer, but also provides connectivity for species such as mountain lion and badger. Much research has been done to document the importance of this connection to wildlife (Soulé 1989, Kohn et al. 1999, Edelman 1991, Sauvajot et al. 2000, Allen 2001, Riley et al. 2003, Ng et al. 2004, Riley et al.

2006a). The existing bridge is regularly utilized by deer, coyotes, and raccoons (Ng et al. 2004). The National Park Service is working with Caltrans to provide a wildlife-specific crossing structure at this location, either a bridged underpass or an overpass, to prevent co-location of vehicle traffic and animal movement options (the current situation). Habitat restoration is also recommended, as well as fencing to direct animals towards the structure.



Looking toward the Simi Hills through the Liberty Canyon underpass.

A variety of wildlife has been documented using the bridge at Alamos Canyon, including mountain lion, bobcat, coyote mule deer, striped skunk, raccoon, small mammals and birds (Ng 2000, Psomas 2002, LSA 2004). This bridge should be maintained, and if the existing road is not needed for vehicular access for maintenance purposes, we suggest removal of the pavement and habitat restoration. We advise conservation of contiguous natural habitats between Happy Camp Canyon Park and protected areas in the Simi Hills and Tierra Rejada Valley.



Looking toward the Santa Susanas through the bridge at Alamos Canyon.

Rocky Peak is in the eastern strand of the linkage and was delineated by the least cost corridor analyses for mountain lion, badger, and mule deer, but also provides habitat for virtually every other focal species modeled. Several protected areas occur here, including Rocky Peak, Santa Susana State Historic, and Corriganville parks. This roadway overpass (roughly 60 feet wide and 130 feet long) connects Santa Susana State Historic Park south of SR-118, with Rocky Peak Park to the north. Mule deer, coyote, bobcat, raccoon, and skunk have been recorded utilizing this structure. The existing bridge could be converted to a vegetated land bridge, with native shrubs and trees tall enough to block lighting and reduce noise from traffic. One lane could be decomposed granite for emergency vehicle access.



Looking south at the Rocky Peak overpass.

Caltrans is working with the National Park Service to monitor wildlife movement at several culverts under SR-23. Proposed improvements include clearing tunnels and culverts and installing wildlife-proof fencing with escape gates to direct animals off the road and through underpasses. The pipe culvert to the right is located north of the Tierra Rejada Valley. Ng et al. (2004) recorded bobcat, coyote, and raccoon using this structure. We encourage protection of remaining natural habitats and conservation measures to maintain the rural character of the Tierra Rejada Valley.



Pipe culvert north of Tierra Rejada; typical of most structures on SR-23.


A Linkage Design for the
Santa Monica - Sierra Madre Connection
Linkage Design
Conservation Lands
Department of Defense Lands
Tribal Lands
Water Body
River or Stream
Highway
County Boundary
N
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E
S
1:350,000
0 1.5 3 6 9 12 Kilometers
0 1.5 3 6 9 12 Miles
Sierra Madre Range
LOS PADRES NATIONAL FOREST
SESPE CONDOR SANCTUARY
Piru Lake
Fillmore
Santa Paula
Ventura
Camarillo
Oxnard
Thousand Oaks
Simi Valley
Happy Camp Canyon Park
Oak Ridge
Big Mountain
Santa Susana Mountains
Rocky Peak Park
Newhall Ranch Open Space
Santa Clarita
Point Mugu State Park
Malibu Creek State Park
Topanga State Park
Santa Monica Mountains National Recreation Area
Santa Monica
Lake
5
126
14
118
101
405
PCH

Sierra Madre-Castaic Connection

This linkage serves to connect the Los Padres and Angeles national forests. The Linkage Design encompasses 398,944 acres, of which 75% is already protected. It covers very diverse ecological settings and encompasses several major vegetation types. It has several main strands, reflecting variation in the habitat needs of different sets of target species. The northern strand is dominated by pinyon-juniper woodland, sagebrush, and desert scrub habitats and serves linkage needs of badger, puma, and mule deer. The central strands connect at generally higher elevations, including a series of hardwood, conifer, chaparral, and riparian habitats. They serve the needs of numerous focal species, including puma, mule deer, Pacific kangaroo rat, California spotted owl, acorn woodpecker, mountain kingsnake, pond turtle, two-striped garter snake, Monterey salamander, and bear sphinx moth. The southernmost strand of the Linkage Design follows the southern foothills and is dominated by coastal oak woodland, coastal sage scrub, valley foothill riparian, and grassland habitats. It provides the only fairly contiguous belt of coastal habitats in the Linkage Design, and provides connectivity for mule deer; Pacific kangaroo rat, acorn woodpecker and Monterey salamander, as well as many other species.



View from the Ridge Route of the Castaic Ranges in spring.

Interstate 5 and State Highway 33 are major transportation routes and are the greatest barriers to wildlife movement. By far the largest of these impediments is I-5, which bisects the linkage for a distance of 27 miles, and currently lacks adequate crossing structures. We call attention to five particular areas (Gorman Creek, Coyote Canyon, Cherry Canyon, Forest Road 6N43, and Big Oak Flat/Canton Canyon) where large crossing structures are needed on Interstate 5. These five areas are important because they provide opportunities for movement of animals via riparian and upland habitats and correspond to least-cost corridors for focal species.

Just south of the SR 138 interchange, Gorman Creek flows through a large bridged undercrossing with concrete flooring. It is then diverted to a concrete channel and funneled toward Pyramid Lake. The channel is fenced with chain link and barbed wire. We recommend removing the concrete flooring of the structure, the entire length of the concrete channel, and the fencing; restoring riparian habitat through the structure; and, if necessary, tapping the water of Gorman Creek farther south. Coordination with the California Department of Water Resources and other agencies will be essential to restore Gorman Creek.



Gorman Creek undercrossing just south of I-5/SR-138 interchange.

Cherry Canyon provides suitable habitat for puma, mule deer, Pacific kangaroo rat, and California spotted owl. At present Cherry Canyon leads to a steep fill slope at I-5. There are many deer trails on this slope, and a major deer trail up Cherry Canyon to the toe of the fill slope. Clearly deer are currently crossing at grade. Topography would allow a wildlife overpass on either the west or the east ridge of Cherry Canyon. Since this is one of the largest canyons crossing I-5, and it offers a direct link to Piru Creek below Pyramid dam, we suggest either a wildlife overpass (where existing cut banks occur) or a bridge be installed across the main wash that follows the contours that existed before the fill slope was created.



Potential site for vegetated landbridge on I-5 on the east ridge of Cherry Canyon.

The bridged underpass for Templin Highway at Canton Canyon is the only large underpass south of Pyramid Lake and currently provides one of the safest wildlife crossings. It is also used by (a) about 20 residences in the area, (b) a few recreationists, and (d) workers at the Castaic power plant. We recommend working with landowners to minimize land uses that compromise linkage function. We suggest reducing the pavement in the underpass from 4 to 2 lanes, restoring and redirecting Canton wash from the concrete culvert, and making the bridge wide enough to accommodate the wash. This would provide ample room to enhance wildlife movement and provide vehicular access.

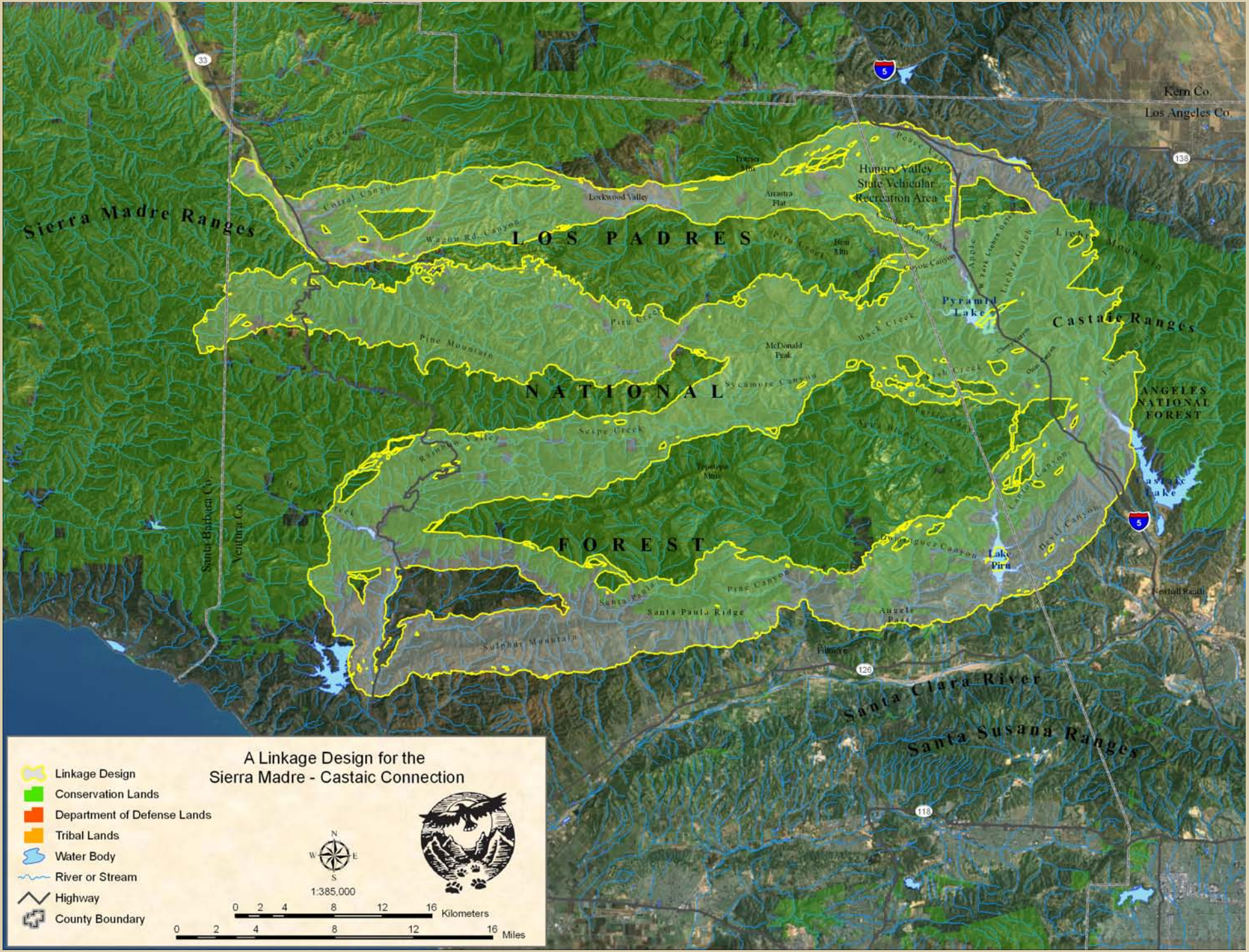


Canton Canyon with Templin Highway underpass at the center of the photo.

The Linkage Design crosses SR 33 in four areas. The best existing structure south of Ojai, which should be maintained is where San Antonio Creek passes under the 33 to join the Ventura River. From the north end of Meiners Oaks and Ojai to the confluence of Apache Canyon with the Cuyama River, we suggest constructing at least one expansive bridge every mile and crossing structures for reptiles, amphibians, and small mammals every 450-900 feet.



San Antonio Creek passing under the 33 to join the Ventura River.


A Linkage Design for the
Sierra Madre - Castaic Connection
Linkage Design
Conservation Lands
Department of Defense Lands
Tribal Lands
Water Body
River or Stream
Highway
County Boundary
1:385,000
0 2 4 8 12 16 Kilometers
0 2 4 8 12 16 Miles
Sierra Madre Ranges
LOS PADRES
NATIONAL
FOREST
Castaic Ranges
ANGELES NATIONAL FOREST
Santa Clara River
Santa Susana Ranges
Kern Co.
Los Angeles Co.
Santa Barbara Co.
Ventura Co.
Hungry Valley State Vehicular Recreation Area
Lockwood Valley
Arrastra Flat
Pyramid Lake
Castaic Lake
Lake Piru
McDonald Peak
Pine Mountain
Santa Paula Ridge
Sulphur Mountain
Angels Pass
Newhall Ranch
Fillmore
Lieber Mountain
Sycamore Canyon
Pine Canyon
Sespe Creek
Piru Creek
Buck Creek
Rainbow Valley
Wagon Rd. Canyon
Coyote Canyon
Lieber Gulch
Angle
Canton Canyon
Devil Canyon
Santa Paula
Apache Canyon
Cottal Canyon
Peace Valley
Bear Mtn
Tapatapa Mtns
Fish Creek
Turtle Canyon
Agua Blanca Creek
Dominguez Canyon
33
5
138
126
118

San Gabriel-Castaic Connection

The majority of both the San Gabriel and Castaic ranges are included in the National Forest system, together forming the Angeles National Forest. The linkage encompasses a unique transition zone between coastal and desert landscapes, featuring coastal sage and chaparral on the west, and desert scrub, juniper and Joshua tree woodlands to the east. The Santa Clara River, one of the last free-flowing rivers in southern California and an integral part of the linkage, provides breeding sites and traveling routes for a variety of wildlife, and supports other critical natural processes such as natural flood control, recharge of groundwater basins, and nutrient cycling. Approximately 12% (2,772 out of 23,947 total acres) of the Linkage Design currently benefits from some level of conservation protection, mostly in Bureau of Land Management parcels and Vasquez Rocks County Park.



Looking toward the San Gabriel Mountains from Vasquez Rocks County Park. Photo credit Andrew M. Harvey, VisualJourneys.net.

The Linkage Design has three strands. The northwest strand is dominated by coastal sage scrub and chaparral and encompasses all or portions of Bee, Spring, Tapie, Tick, and Mint Canyons. It serves most of the focal species, including puma, mule deer, Pacific kangaroo rat, and California thrasher. The eastern strand connects a series of desert scrub and juniper woodland habitats, thereby linking habitat for species such as badger, burrowing owl, and bear sphinx moth that prefer the open habitats that are prevalent in desert plant communities. The third distinct strand of the Linkage Design follows the Santa Clara River and Soledad Canyon and provides large stepping-stones of habitat for semi-aquatic species, such as the western pond turtle, two-striped garter snake, and mountain kingsnake; it also serves a suite of aquatic and riparian-dependent

species (e.g., Unarmored three-spine stickleback, Santa Ana sucker, arroyo chub, California red-legged frog, arroyo toad), not specifically addressed by our analyses.

State Route 14 and Sierra Highway are major transportation routes and pose the greatest barriers to wildlife movement. By far the largest of these impediments is SR-14, which bisects the southern part of the linkage for a distance of eight miles. We have identified four locations at which crossing structures should be located (1) near the confluence of Spring Canyon, Bee Canyon and the Santa Clara River; (2) Agua Dulce Canyon; and (3 & 4) both places where Escondido Creek crosses the freeway.

The least cost corridors for puma, badger, mule deer, and Pacific kangaroo rat cross the freeway near the confluence of Spring Canyon, Bee Canyon, and the Santa Clara River. The existing bridge for Spring Canyon Road is inadequate to accommodate wildlife movement due to the steep fill slope for Soledad Canyon Road, lack of natural vegetation, asphalt in the two-lane underpass, and the mining operation in the Santa Clara River make it unlikely that this structure and the surrounding habitat can be restored to provide meaningful connectivity in the foreseeable future. We recommend a new bridge about 1200 feet east of the existing structure, and redirecting the main channel of Spring Canyon so that it would join Bee Canyon just south of SR-14, near the Santa Clara River. The new bridge would replace a section of fill slope along the low ridge between lower Spring and Bee Canyons. This design would provide a long and essentially undisturbed canyon (Spring Canyon) that would funnel animals toward a SR-14 underpass from the north. The south side of the freeway is close to both riparian and upland habitats, and away from the gravel mine.



Removing the fill slope under SR-14 would route Spring Canyon to Bee Canyon and the Santa Clara River.



Agua Dulce Canyon vehicle underpass, with drainage culvert for stream visible to the left of the underpass.

At present Agua Dulce Creek passes under SR-14 via an oversized concrete pipe culvert, with concrete flooring, poor visibility to the other side, and no vegetation in the structure, reducing the likelihood for plant and animal movement. South of SR-14, the riparian vegetation is well developed with cottonwoods, sycamores, and willows, and no significant riparian or upland impediments between SR-14 and Soledad Canyon (and the Angeles NF boundary) about two miles to the south. Immediately north of the freeway, the riparian vegetation is much reduced, and the town of Agua Dulce lies about one mile north, impeding meaningful riparian connectivity at this time. To maximize the utility of Agua Dulce Creek as a movement area, we recommend removing the fill slope under SR-14 and upgrading the existing vehicle underpass to a bridged undercrossing that spans the canyon. Improving this structure could help animals get to Vasquez Rocks or funnel them toward the middle strand of the Linkage Design to Spring, Tapie, and Tick Canyons.


Sierra Pelona Mountains
ANGELES
NATIONAL
FOREST
Castaic Ranges
Del Sur Ridge
Sierra Pelona Valley
Agua Dulce
VASQUEZ ROCKS
Escondido Canyon
Soledad Canyon
Santa Clarita
San Gabriel Mountains
ANGELES
NATIONAL
FOREST
Magic Mountain
A Linkage Design for the
San Gabriel - Castiac Connection
Linkage Design
Conservation Lands
Department of Defense Lands
Tribal Lands
Water Body
River or Stream
Highway or Major Road
1:130,000
0 1 2 4 6 Kilometers
0 1 2 4 6 Miles

San Gabriel-San Bernardino Connection

This linkage provides connectivity between two expansive areas of the Angeles and San Bernardino National Forests. Approximately 66% (77,941 out of 129,901) of the Linkage Design currently enjoys some level of conservation protection, mostly in National Forest land, whose management policies do not allow conversion to urban or agricultural use. The San Andreas Rift Zone runs through the linkage, producing steep rugged topography and a variety of microhabitats that support a rich diversity of natural communities, from coastal sage scrub and alluvial fan habitats in the southern foothills, chaparral, mixed conifer and oak woodlands in the central part of the linkage, transitioning to pinyon-juniper woodlands and desert scrub in the north. This linkage provides live-in and move-through habitat for rare wildlife such as bighorn sheep, San Bernardino kangaroo rat, and the metalmark butterfly.



Snow capped peaks in the San Gabriel-San Bernardino Connection.

At first glance, the linkage between the San Bernardino and San Gabriel Mountain Ranges seems simply to be a matter of getting plants and animals across Interstate 15. Indeed, for most species, the freeway is the most obvious barrier between core population centers, and National Forest land abuts both sides of the freeway for several miles. However, a Linkage Design that simply maintained and improved permeability along I-15's frontage with Forest Service land would fail to provide connectivity for lowland species along the southern foothills, and could result in Baldy Mesa becoming an island or peninsula of habitat, hemmed in by urban and agricultural land on the north, increasingly dense ranchette development on the south and west, and I-15 on the south and east. Therefore, the Linkage Design has three roughly parallel routes to accommodate diverse species and ecosystem functions.

The northern strand offers a high desert connection dominated by chaparral with scattered patches of desert scrub, juniper and Joshua tree woodlands, grassland, and riparian habitats, serving species such as the badger, rock wren, horned lizard, and metalmark butterfly. It extends

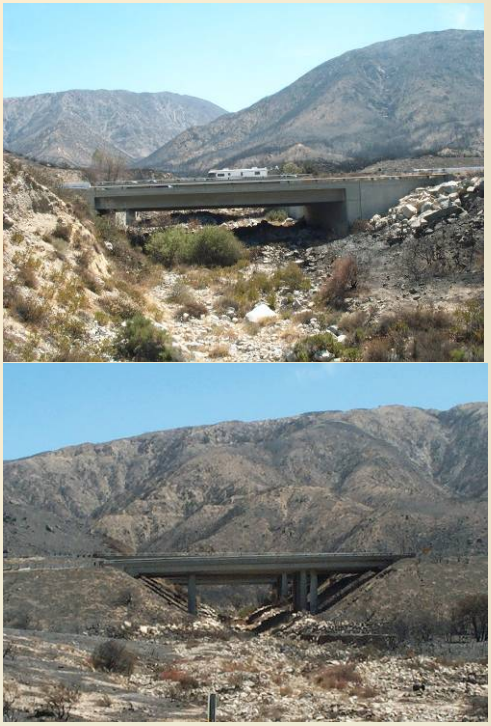
from the Upper North Fork of Lytle Creek, across Stockton Flat, down into Lone Pine Canyon, across Cajon Pass to Horsethief Canyon, up into Summit Valley and then on to the West Fork of the Mojave River. The central strand links a series of higher elevation forest and shrubland habitats serving numerous species, including puma, mule deer, spotted owl, mountain quail, and wrentit. This strand also offers the best potential connection for bighorn sheep, pygmy nuthatch, treefrog, whipsnake, and speckled dace. It encompasses the majority of land between Upper Lytle Creek Ridge, lower Lone Pine Canyon, Crowder and Cleghorn Canyons in the north and Cucamonga and Arrowhead Peaks in the south. The southern strand encompasses coastal and alluvial fan scrub habitats from San Antonio, Cucamonga, Deer, Day, Etiwanda, Morse, and San Sevaine creeks, to Lytle Creek and Cajon Wash, serving the movement needs of the endangered San Bernardino kangaroo rat and slender-horned spineflower, as well as the Pacific kangaroo rat, tarantula hawk, giant flower-loving fly, and California sagebrush.

Interstate 15 and State Route 138 are the major transportation routes and pose the most substantial barriers to wildlife movement. Interstate 15 is by far the most severe impediment, bisecting the linkage for a distance of roughly 17 miles, with 46 million vehicles a year traveling through the pass (USDA Forest Service 2004). Currently, State Route 138 (Rim of the World) is a two-lane road that receives light tourist traffic, though substantial increases in traffic and upgrading of the highway are planned. The US Forest Service is working with the Department of Transportation and Biological Resources division of US Geological Survey to design adequate linkages that will include one or more bridges and other large crossing structures to accommodate wildlife movement. Historic Route 66 and several major rail lines run alongside the freeway in many areas, adding to the barrier effect.



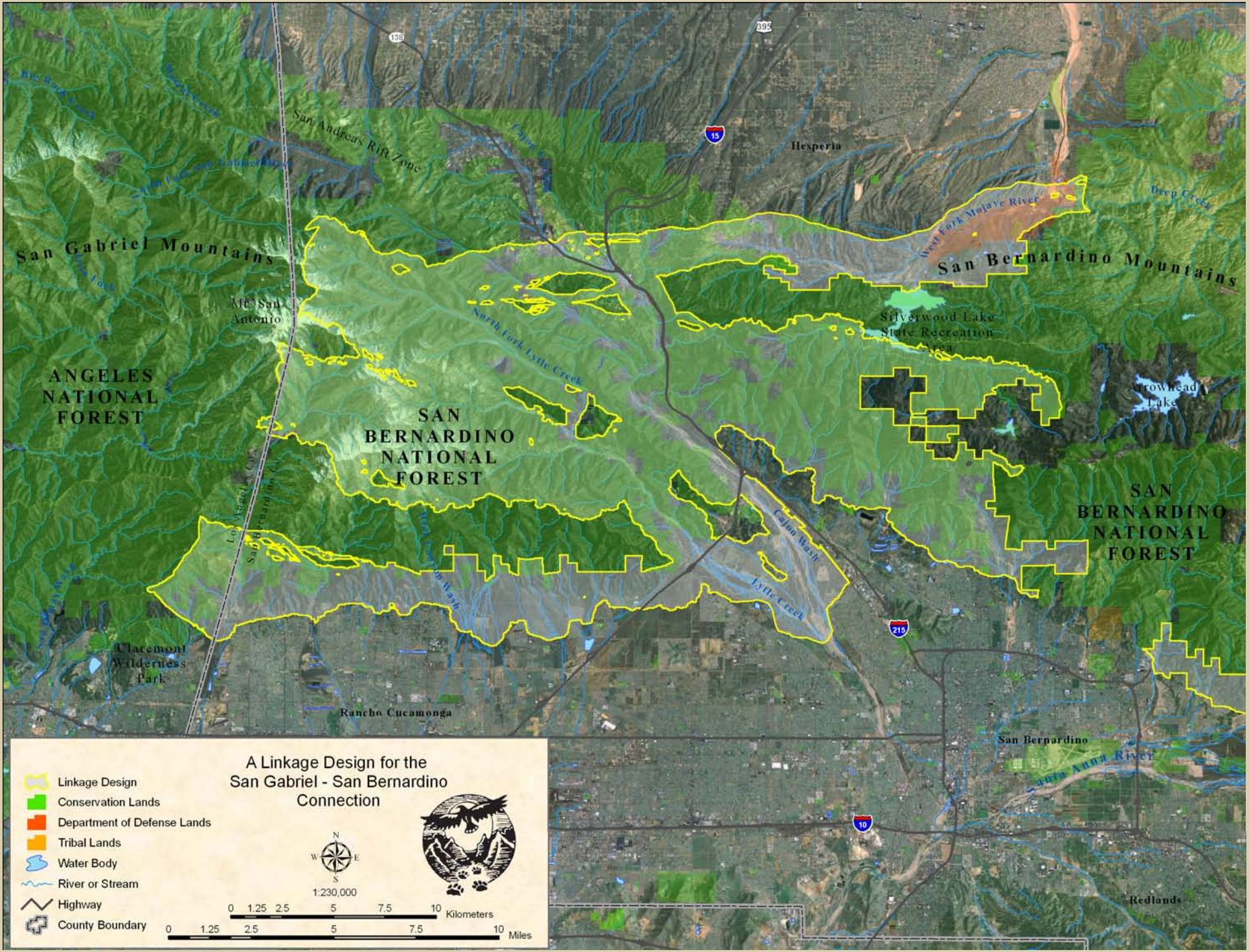
View down Cleghorn Canyon under I-15.

There are currently three bridges along I-15 that accommodate animal movement. All three occur within a one and a half mile long section of the highway south of the Cajon interchange. By far the best of these is the bridge at Cleghorn Canyon. The Least Cost Corridors for puma, mule deer, and bighorn sheep cross I-15 at Cleghorn Canyon, and there is a perennial spring in the upper canyon that draws animals into the drainage. Until new or upgraded crossing structures are available, it is critical that this structure be maintained and that the private and public lands near it are protected from urban development.



Bridges on I-15 north of Cleghorn Canyon; the top is 0.7 miles north of Cleghorn; the bottom is 400 yards south of the Cajon interchange.

The other two bridged crossings lie to the north of Cleghorn Canyon and south of the site of old Cajon. Compared to the bridge at Cleghorn Canyon, these bridges have shorter spans, less clearance above the wash, and the canyons drain much smaller watersheds (100 to 300 acres, compared to about 1500 acres for Cleghorn). They may be expected to serve focal species, such as the Pacific kangaroo rat, San Diego horned lizard, and Chaparral whipsnake.


A Linkage Design for the
San Gabriel - San Bernardino
Connection
Linkage Design
Conservation Lands
Department of Defense Lands
Tribal Lands
Water Body
River or Stream
Highway
County Boundary
1:230,000
0 1.25 2.5 5 7.5 10 Kilometers
0 1.25 2.5 5 7.5 10 Miles
San Gabriel Mountains
ANGELES NATIONAL FOREST
SAN BERNARDINO NATIONAL FOREST
San Bernardino Mountains
SAN BERNARDINO NATIONAL FOREST
Mt. San Antonio
San Andreas Rift Zone
Hesperia
West Fork Mojave River
Deep Creek
Silverwood Lake State Recreation Area
Arrowhead Lake
North Fork Lytle Creek
Lytle Creek
Cajon Wash
Claremont Wilderness Park
Rancho Cucamonga
San Bernardino
Santa Ana River
Redlands
15
215
10
138
395

San Bernardino-Granite Connection

This linkage connects the San Bernardino National Forest with extensive natural lands in the Granite, Ord, and Rodman Mountains. The Linkage Design encompasses 11,322 acres, of which approximately 38% (4,272 acres) currently enjoys some level of conservation protection, mostly Bureau of Land Management lands in the eastern strand of the linkage. This linkage is also within the California Desert Conservation Area and is addressed by the West Mojave Plan (BLM 2003, 2005). The linkage comprises two main strands, which accommodate overlapping but somewhat different suites of species.

The western strand was delineated by the permeability analyses for bighorn sheep, badger, and Pacific kangaroo rat and includes both riparian and upland habitats. It would also serve the movement needs of such diverse species as antelope ground squirrel, desert woodrat, and speckled rattlesnake. It extends from the San Bernardino Mountains, encompassing both Grapevine and Lovelace canyons, through Fifteenmile Valley and across State Highway 18, to enter the Granite Mountains at Fifteenmile Point. There is little surface water in the linkage, but Grapevine Canyon flows out of the San Bernardino Mountains through a dense riparian forest dominated by cottonwood (*Populus fremontii*) and various willow species (*Salix* spp.) before emptying into a broad bajada in Fifteenmile Valley. In addition to facilitating movements for several focal species, this strand supports habitat for several listed and sensitive species, including the Mojave ground squirrel (CDFG 2005).



The eastern strand of the Linkage Design encompasses rocky terrain and is dominated by creosote bush with scattered Joshua trees.

The eastern strand of the Linkage Design encompasses more rocky terrain. It was also delineated by the permeability analysis for bighorn sheep but should also serve badger, antelope ground squirrel, Pacific kangaroo rat, Merriam's kangaroo rat, and rock wren. This strand extends from Black Hawk Mountain near Cushenberry Canyon in the San Bernardino Mountains, through Fry Valley to the Fry and Rodman Mountains, crossing State Highway 247 between Lucerne and

Johnson Valleys. It encompasses Joshua tree woodland and pinyon-juniper woodland in the foothills of the San Bernardino Mountains, desert scrub through the valley and Fry Mountains, and sagebrush habitats in the Rodman Mountains. The eastern strand of the linkage includes substantial public ownerships that protect natural habitats from development.

State Highway 18 (Happy Trails Highway) and Highway 247 (Old Woman Spring Road) are the only major transportation routes crossing the linkage and the only paved roads. State Highway 18 bisects the western strand of the linkage and State Highway 247 crosses the eastern strand; both are currently at grade for their entire length. Opportunities for using natural topographic features to enhance habitat connectivity in the linkage are limited and no crossing structures currently exist. The speed limit is 55 mph along both stretches of highway in the linkage, but many vehicles far exceed this limit. Although flat desert highways seem to be destined for high speeds, we suggest reducing the speed limit on both highways to 45 mph through each strand of the linkage. We also recommend installing wildlife crossing signs to alert drivers they are entering a wildlife movement corridor. Laser and infrared activated warning signs with flashing lights may be an option to alert drivers to slow down for wildlife (Reed 1981, Messmer et al. 2000, Gordon 2001, Robinson et al. 2002, Huijser and McGowen 2003). These two actions alone could significantly reduce wildlife mortality in the linkage area but other measures can be taken to improve wildlife movement when the next highway improvement projects are undertaken. Future transportation projects will likely widen both of these two-lane highways to at least four lanes. These transportation improvement projects represent timely opportunities to improve habitat connectivity. We suggest a roadkill study as part of the upgrade projects, with design of crossing structures contingent on results.



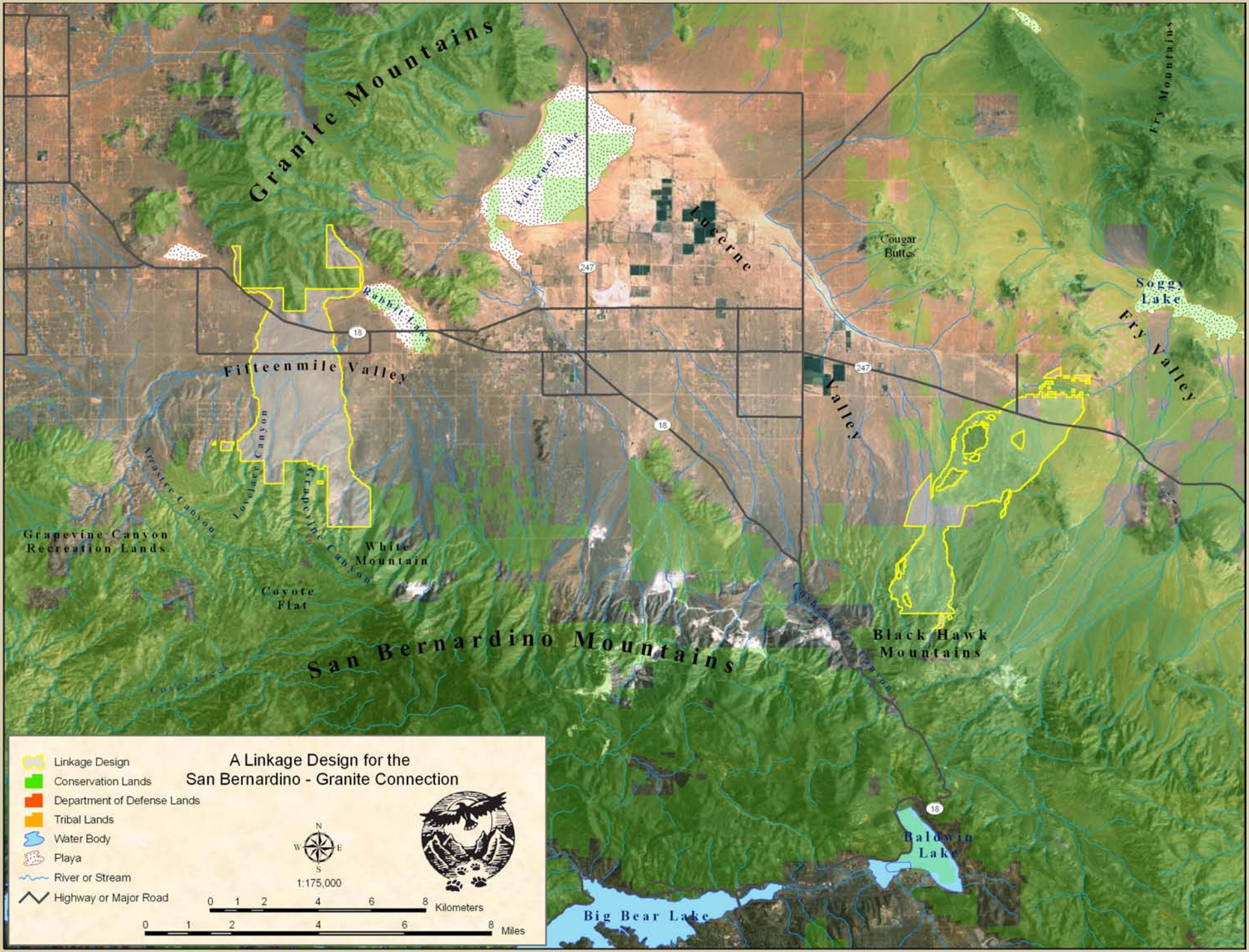
Western strand: State Highway 18 looking south toward Grapevine and Lovelace canyons in the San Bernardino Mountains from Fifteenmile Point in the Granite Mountains.

In the western strand, we recommend burying or elevating a stretch of State Highway 18 at least 650 feet long to provide an at-grade wildlife crossing that conforms to the natural topography of the site. To either side of this structure, we suggest installing several pipe culverts (one foot diameter), spaced fairly frequently to provide passage for small mammals and reptiles.

If wildlife movement studies for road improvement projects confirm bighorn sheep movement through the eastern strand of the linkage, we recommend installing a vegetated overpass over State Highway 247. Although the topography in this area isn't ideal to accommodate a ridge-to-ridge overpass, there is a ridge south of the highway that could be extended out and over the roadway, creating an overpass for wildlife and a tunnel for vehicular traffic. The structure should be at least 650 to 985 feet wide and should be strong enough to allow placement of large boulders along each side of the overpass to minimize noise from the highway, with a soil depth sufficient to maintain desert vegetation. The overpass should be vegetated using plants propagated from cuttings and seed collected from the surrounding vegetation communities.



Eastern strand: the ridge south of the highway could be extended out and over the roadway providing an overpass for wildlife and a tunnel for vehicular traffic.


Granite Mountains
Fry Mountains
Lucerne Lake
Lucerne
Cougar Buttes
Soggy Lake
Fry Valley
Rabbit Lake
Fifteenmile Valley
Valley
Fracture Canyon
Lovelace Canyon
Grapevine Canyon
Grapevine Canyon Recreation Lands
White Mountain
Coyote Flat
San Bernardino Mountains
Black Hawk Mountains
Baldwin Lake
Big Bear Lake
Linkage Design
Conservation Lands
Department of Defense Lands
Tribal Lands
Water Body
Playa
River or Stream
Highway or Major Road
A Linkage Design for the
San Bernardino - Granite Connection
1:175,000
Kilometers
Miles

San Bernardino-Little San Bernardino Connection

This linkage connects San Bernardino National Forest with Joshua Tree National Park. It also connects the South Coast Ecoregion to the Mojave and Sonoran Deserts and encompasses a unique variety of both coastal and desert habitats. The Linkage Design encompasses 60,805 acres, of which approximately 62% (37,650 acres) currently receives some level of conservation protection. The majority of land in the Linkage Design within Riverside County will be included in the Coachella Valley Multiple Species Habitat Conservation Plan (MSHCP).



The Big Morongo Canyon Preserve in the linkage is known internationally for its bird diversity. In this landscape of predominantly dry vegetation, the desert oases provide essential resources that attract a diversity of wildlife such as mountain lion, bighorn sheep as well as rare aquatic species.

The Linkage Design has five major swaths or strands. The most northerly strand is a high desert connection dominated by juniper and Joshua tree woodlands. It extends from Antelope Creek and meanders in and out of Pipes Canyon, takes in a wide swath of habitat between Morongo and Yucca Valleys, and enters Joshua Tree National Park near Burnt Mountain. The next strand extends from Onyx Spring in the San Bernardino Mountains, and follows Little Morongo Canyon; it is especially important for species requiring a contiguous riparian connection. The next strand follows Big Morongo Canyon, which flows out of the San Bernardino Mountains through riparian forests dominated by white alders and cottonwoods before emptying into a broad bajada in the Morongo Basin, which then feeds the oasis in Big Morongo Canyon Preserve. The widest strand extends from Dry Morongo Canyon to Mission Creek and encompasses the steepest terrain along State Route 62. Dry Morongo Creek flows southward out of the San Bernardino Mountains, passes under State Route 62, and then meanders along the highway to empty into Mission Creek. The most southerly strand encompasses much of the Mission Creek watershed, as well as the southern segments of Little Morongo, Big Morongo, and Dry Morongo washes, where they empty into Mission Creek.

State Route 62 is the most substantial impediment to movement within the Linkage Design. Several structures along State Route 62 accommodate various levels of animal movement.

Mission Creek is an excellent lowland linkage that provides live-in and move-through habitat for several species. Desert scrub occurs in the uplands, and desert willows line Mission Creek. There are two well-designed bridges where the creek flows under the highway and animals that follow washes could then enter Big Morongo, Midway, or White House Canyons in the Little San Bernardino Mountains. Big Morongo appears to be the best route; we recorded numerous species using it, including mountain lion, bobcat, and gray fox. Off-road vehicle signs were visible beneath both bridges and efforts should be made to discourage these activities.

The least cost corridor for bighorn sheep crossed State Route 62 in very rugged topography. We recommend a ridge to ridge vegetated overpass. To the extent possible, the overpass should follow the contours that existed prior to the highway being constructed. The structure should be at least 650 to 985 feet wide and strong enough to allow placement of large boulders along each side to minimize noise from the highway. The overpass should be vegetated using plants propagated from cuttings and seed from the area.

A well-designed bridge that allows wildlife movement is found where Dry Morongo Wash flows under State Route 62. There are springs in the upper canyon that draw animals into the drainage. The area is also popular with off-road vehicle enthusiasts. These activities impact soils and vegetation and will inhibit species from using this crossing. We recommend preventing off-road vehicles from entering the canyon and enforcing closures. This structure should be maintained and lands near it protected.

Big Morongo Wash passes under State Route 62 via a box culvert. We recommend a bridge here that is tall enough and sufficiently wide to provide views to the other side, with natural flooring. We recommend measures to confine light and noise pollution to home sites, and advise conservation of land in the broad bajada of the wash, and parcels that straddle the highway to enhance the integrity of the linkage.



One of two bridges for Mission Creek; this is the southernmost bridge.



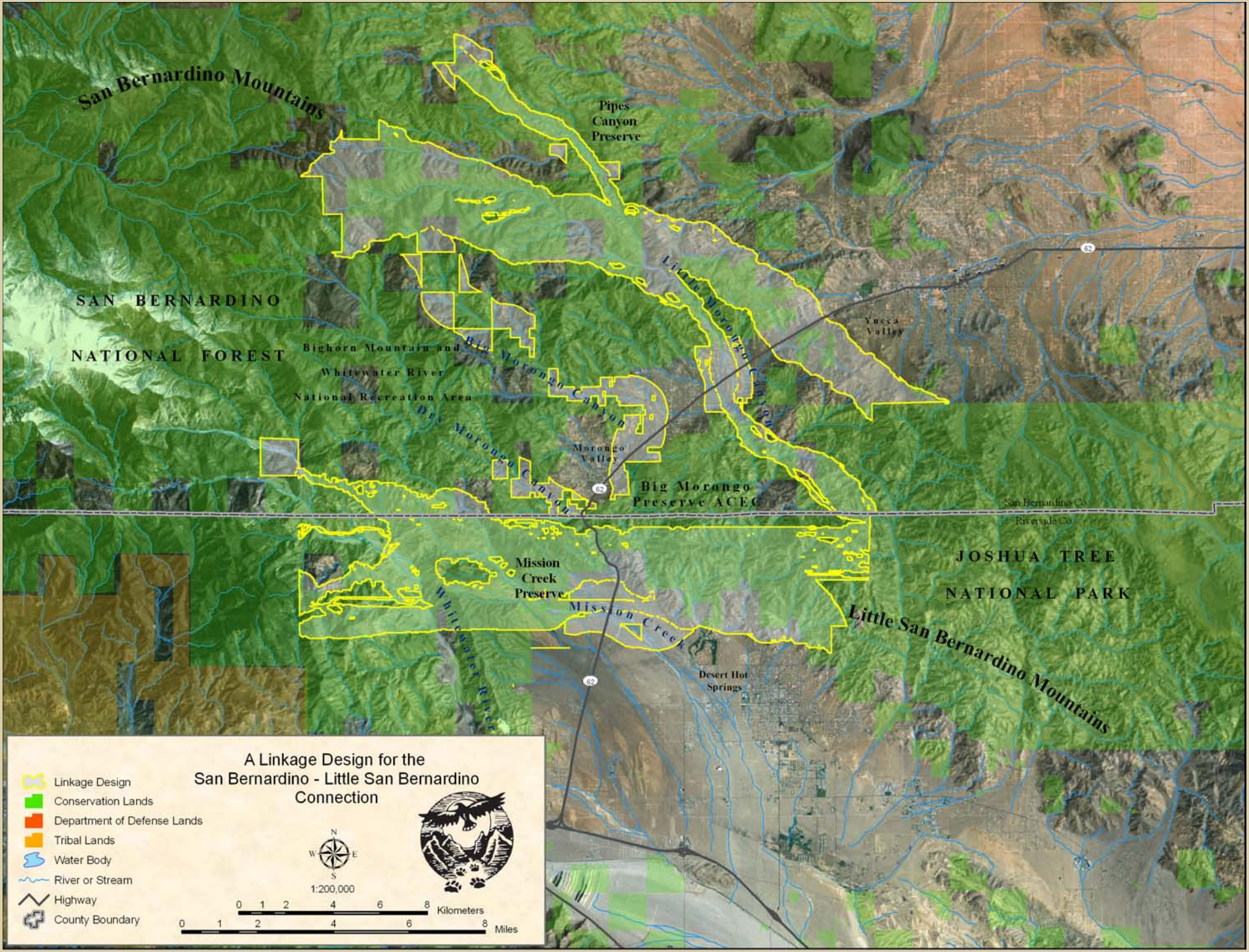
We recommend a vegetated wildlife overpass be built in this area to accommodate bighorn sheep movement.



Looking down Dry Morongo Canyon from BLM parcel west of the highway.



The culvert for Big Morongo Wash flowing under State Route 62.


San Bernardino Mountains
Pipes Canyon Preserve
SAN BERNARDINO
NATIONAL FOREST
Bighorn Mountain and Whitewater River
National Recreation Area
Big Morongo Canyon
Dry Morongo Canyon
Little Morongo Canyon
Morongo Valley
Yucca Valley
Big Morongo Preserve ACEC
San Bernardino Co.
Riverside Co.
JOSHUA TREE
NATIONAL PARK
Mission Creek Preserve
Mission Creek
Whitewater River
Desert Hot Springs
Little San Bernardino Mountains
62
A Linkage Design for the
San Bernardino - Little San Bernardino
Connection
Linkage Design
Conservation Lands
Department of Defense Lands
Tribal Lands
Water Body
River or Stream
Highway
County Boundary
N
W
E
S
1:200,000
0 1 2 4 6 8 Kilometers
0 1 2 4 6 8 Miles

San Bernardino-San Jacinto Connection

This linkage provides a connection between the San Bernardino and San Jacinto mountains, which together form the San Bernardino National Forest. The San Bernardino Mountains are part of the Transverse Ranges and feature the highest peak in southern California, Mount San Gorgonio, while the San Jacinto Mountains are the highest and northernmost of the Peninsular Ranges. Both coastal and desert habitats occur in the lowlands between these mountain masses, with the San Gorgonio River marking the transition between coastal habitats in the west and desert habitats in the east. The Linkage Design encompasses a total of 74,414 acres, of which approximately 29% (21,223 acres) is currently protected. The majority of unprotected land in the linkage could be conserved through the Western Riverside MSHCP and the Coachella Valley MSHCP (County of Riverside 2002, CVAG 2004).



Looking across the broad bajada of the San Gorgonio River toward the San Jacinto Mountains.

The Linkage Design has five routes to accommodate diverse species and ecosystem functions. The western strand links the San Bernardino Mountains with the Badlands and extends from Noble Creek in the San Bernardino Mountains, taking in the wide swath of natural habitats remaining between the communities of Calimesa and Cherry Valley, and entering San Timoteo Canyon in the Badlands. The next strand encompasses the San Gorgonio River, which forms a substantial alluvial fan through the pass to its confluence with the Whitewater River. This strand is intended to serve badger, large-eared woodrat, Merriam's kangaroo rat, and coast horned lizard. The San Gorgonio River is especially important for a number of rare endemic species associated with alluvial fans (County of Riverside 2002, CVAG 2004). The strand in the foothills of the San Jacinto Mountains near the confluence of Smith Creek and the San Gorgonio River accommodates several focal species including mountain lion, chaparral whipsnake, and slender-horned spineflower. The Stubbe Canyon Wash strand was delineated by the landscape

permeability analysis for mountain lion but is also expected to serve species such as badger and little pocket mouse. The easternmost strand follows the Whitewater River, which empties into a broad bajada in the San Gorgonio Pass at the base of the San Jacinto Mountains. This strand was delineated by the landscape permeability analysis for puma but also serves focal species such as California treefrog, and white alder.

Interstate 10, Highway 111 and Highway 79 are the major transportation routes posing the most substantial barriers to movement. Interstate 10 bisects the linkage for roughly 11 miles. Several existing structures accommodate various levels of animal movement.

There is a series of crossing structures where the San Gorgonio River flows under Interstate 10, and for the service road between the freeway and the railroad tracks. Animals that follow washes can then enter several canyons in the San Jacinto Mountains. Just downstream, however, a low concrete dike runs almost the full width of the river, deflecting flow to the south bank to protect a mining operation that occupies the river bottom. Mining operations in the river decrease its value as a travel corridor, closing and restoring these areas would benefit this connection.



Bridge spanning the San Gorgonio River.

There is a series of under-crossings to accommodate Stubbe Wash, which crosses the freeway and service road in two places, roughly 90 feet apart. There is some native vegetation at the approach of these structures, but virtually no vegetative cover through the entire length of the structures. We suggest planting native shrubbery in between each bridge. We also recommend maintaining the rural character of the landscape by confining light and noise pollution to existing home sites in the vicinity.

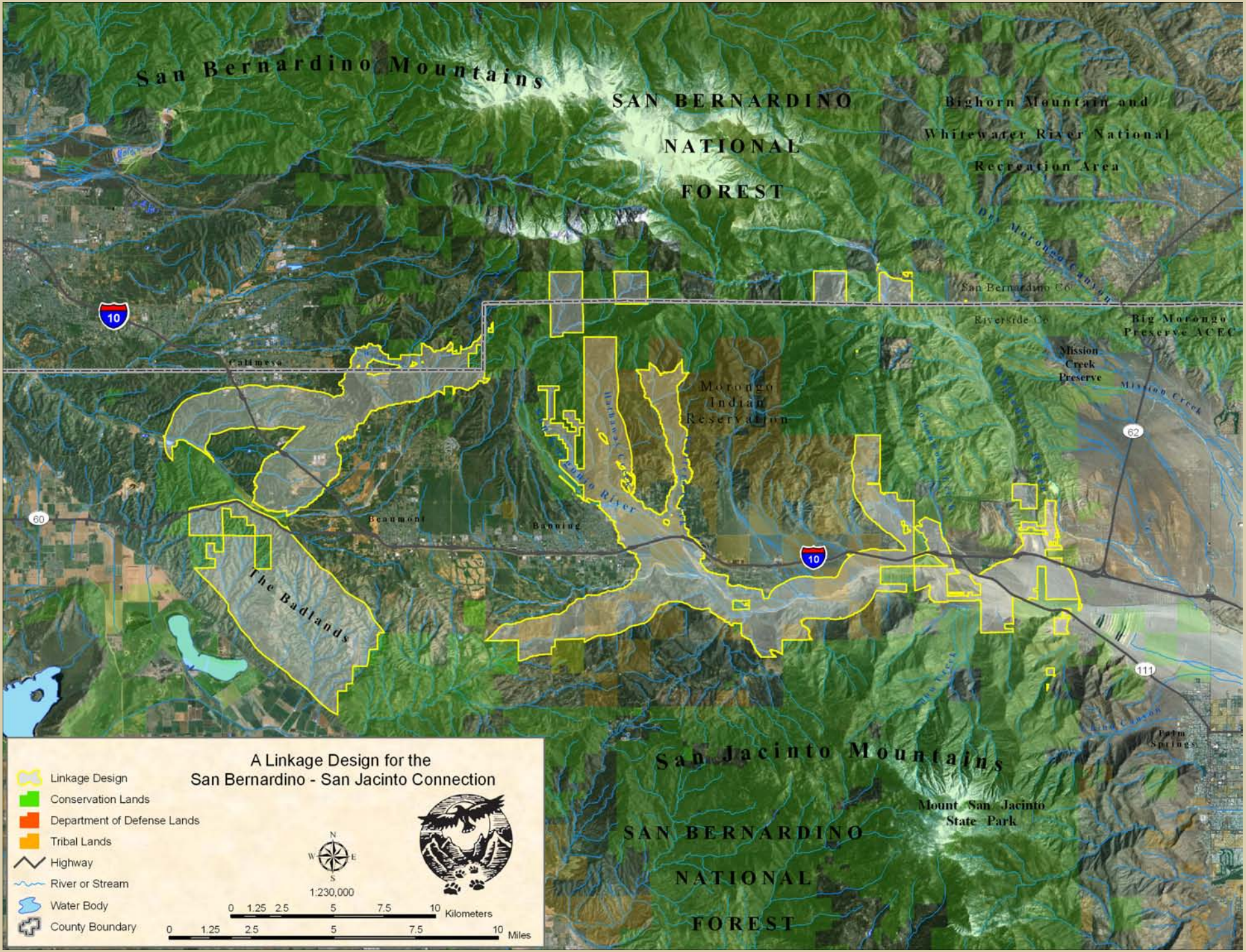


Looking toward the San Jacintos at the westernmost bridges over Stubbe Canyon.

There is also a series of bridges for the Whitewater River, and one for the service road. The Whitewater River had the highest frequency of bobcat use; coyote, rabbit, and roadrunners were also documented here (Myers et al. 1996). Public agencies bulldoze a stretch of the river to increase percolation for groundwater recharge; we recommend habitat restoration here. There are windmills in the river south of the freeway that are enclosed by chain-link fence, which should be removed to allow animals to roam the floodplain and access side canyons more easily.

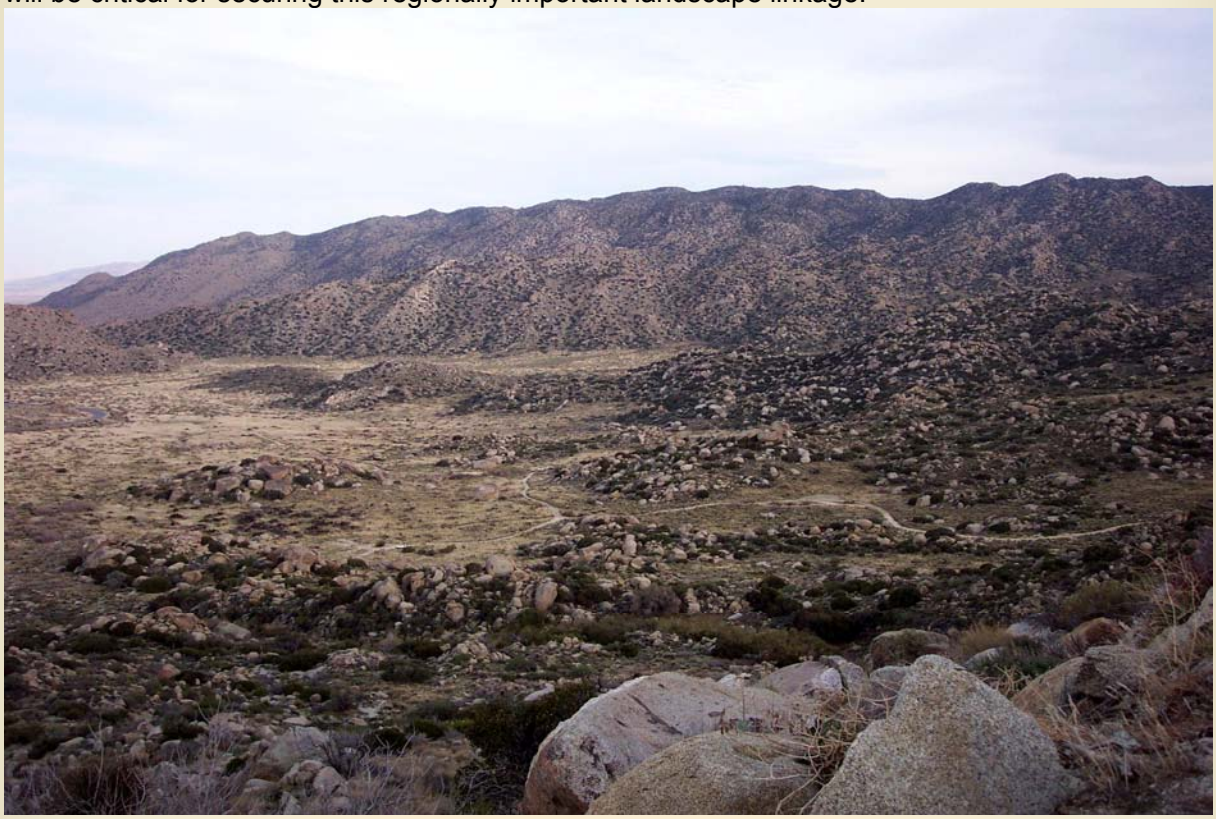


Looking toward the San Jacintos through the bridge over the Whitewater River.



San Bernardino Mountains
SAN BERNARDINO NATIONAL FOREST
Bighorn Mountain and Whitewater River National Recreation Area
Dry Morongo Canyon
San Bernardino Co
Riverside Co
Big Morongo Preserve ACEC
Mission Creek Preserve
Mission Creek
Morongo Indian Reservation
Hathaway Creek
Beaumont
Banning
The Badlands
Palm Springs
San Jacinto Mountains
Mount San Jacinto State Park
SAN BERNARDINO NATIONAL FOREST
10
60
62
111
A Linkage Design for the
San Bernardino - San Jacinto Connection
Linkage Design
Conservation Lands
Department of Defense Lands
Tribal Lands
Highway
River or Stream
Water Body
County Boundary
N
W
E
S
1:230,000
0 1.25 2.5 5 7.5 10 Kilometers
0 1.25 2.5 5 7.5 10 Miles

This linkage facilitates wildlife movement between Cleveland and San Bernardino National Forests and Anza Borrego Desert State Park, and overlaps portions of the Cahuilla and Santa Rosa Reservations. The Linkage Design encompasses 204,766 acres, of which approximately 57% (116,396 acres) currently enjoys some level of conservation protection, mostly in land administered by Bureau of Land Management, Forest Service, California State Parks, The Nature Conservancy, and the counties. Portions of the Cahuilla and Santa Rosa reservations also occur and are almost entirely covered by high-quality natural habitats. Coordination with Tribal Councils will be critical for securing this regionally important landscape linkage.



One of many magnificent vistas of the rocky terrain in Anza Borrego Desert State Park.

The Linkage Design has three major strands. The most northerly strand extends from the Palomar Ranges of Cleveland National Forest, encompassing the coastal sage scrub and chaparral habitats surrounding Vail Lake and on Billy Goat, Cahuilla and Little Cahuilla mountains, the riparian habitats along Temecula Creek, Wilson Creek, Bautista Canyon, Lion Canyon, and Cottonwood Creek, and the oak woodland and hardwood conifer habitats in the foothills of the San Jacinto Mountains. This strand was delineated by the landscape permeability analysis for mule deer and mountain lion but also provides the largest core areas of suitable habitat for quino checkerspot butterfly. The central strand follows a series of valleys, from Aguanga Valley near the junction of highways 371 and 79, through the Cahuilla and Anza valleys and up into Garner Valley in the San Jacinto Mountains. This strand was delineated by the landscape permeability analysis for badger, a species that prefers grassland habitats in flat or gently sloping terrain, but it is also intended to serve the Aguanga kangaroo rat, loggerhead shrike, rock wren, and coast horned lizard. The southern strand extends from the Palomar Ranges, and encompasses habitats around Oak Grove, on Beauty Mountain, Tule Peak, and Iron Spring Mountain, and in Copper Canyon, Previtt Canyon and the Chihuahua Valley, to Table Mountain in the Santa Rosa Mountains. This strand was defined by the landscape permeability

analysis for mountain lion but it provides live-in and move-through habitat for a number of native species.

State Route 79, and Highways 74, and 371 are the primary impediments to movement. The 79 is a two-lane heavily traveled highway that is at-grade for much of its length, except where it crosses major drainages. Highway 371 runs east-west through the central strand of the linkage, from its juncture with Highway 79 in the Aguanga Valley, to its juncture with Highway 74 near Garner Valley. This busy two-lane road is mostly at grade, with very few existing crossing structures. Highway 74 runs through Garner Valley for roughly 11 miles in the linkage. Several structures exist that facilitate various levels of wildlife movement.

There is a sizeable culvert on Highway 79 for Tule Creek with suitable habitat in the vicinity for mountain lion, badger, large-eared woodrat, western toad, coast horned lizard, and pale swallowtail. Tule Creek supports a well-developed cottonwood willow riparian forest; however tamarisk (*Tamarix ramosissima*), has invaded this system. We recommend habitat restoration to eradicate or control this and other non-native species. If transportation projects are undertaken, the culvert should be replaced with a bridge at least 24 feet wide and as close to 12 feet high as topography will allow.



Looking up Tule Creek at the concrete box culvert under Highway 79.

Chihuahua Creek flows under Highway 79 through an expansive well-designed bridge that facilitates wildlife movement in the southern strand of the linkage. Coast live oak riparian forest lines Chihuahua Creek, with grassland, sagebrush and redshank chaparral in the uplands. The bridge is roughly 30 feet high and 138 feet wide. When transportation projects occur, the dimensions of the structure should remain the same. Lands along the creek effectively link the Palomar and Santa Rosa Mountains, with only a few parcels remaining to secure this fully functional connection.

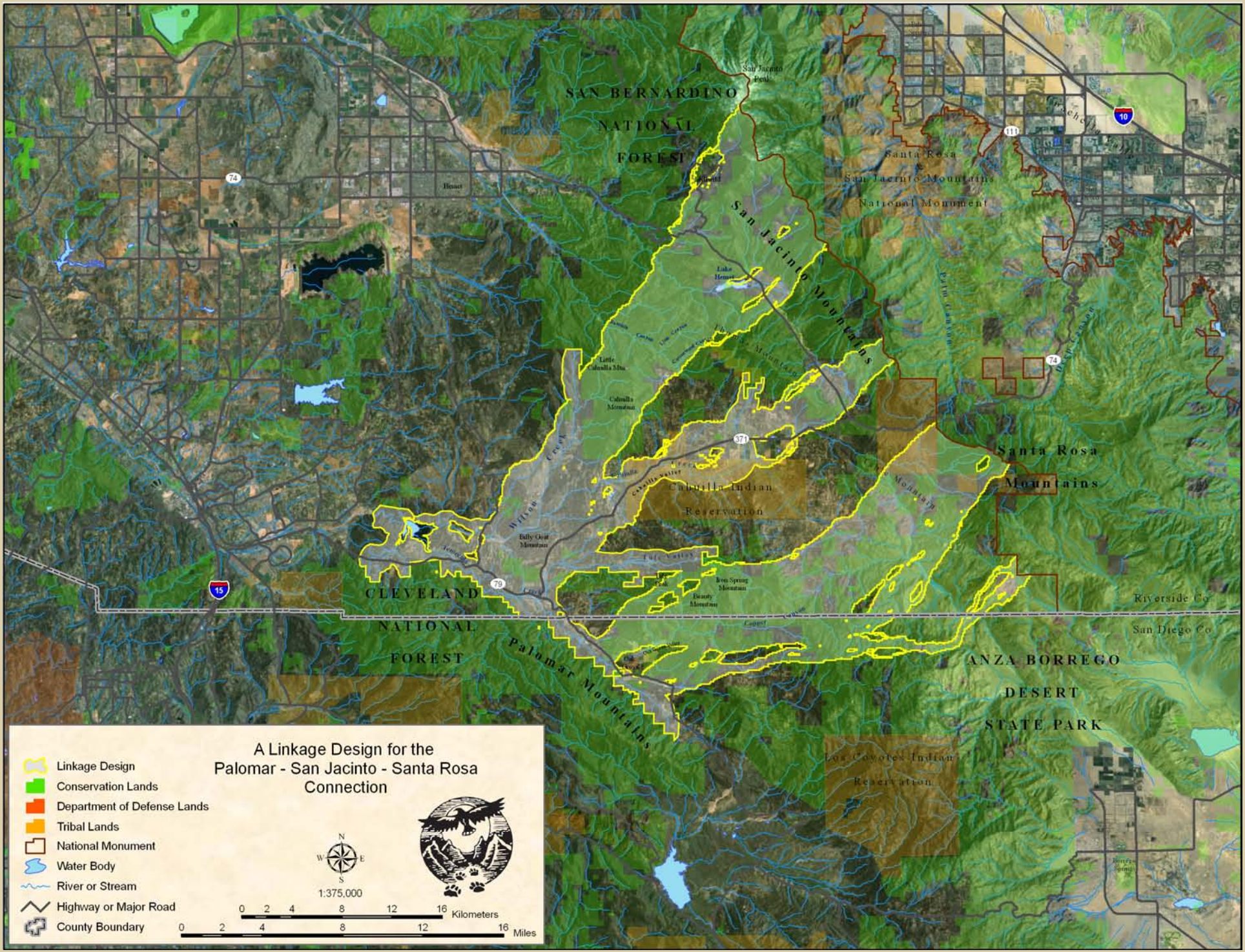


Looking down Chihuahua Creek toward the Palomar Ranges.

Highway 74 runs through Garner Valley for roughly 11 miles in the linkage. Several structures were incorporated into the original road design. There are three box culverts measuring four feet high and wide, and 23 feet long. There are also two box culverts in this stretch of highway but each has a significant drop off at the eastern entrance, which should be fixed to provide passage. There are two bridges (6' high, 43' wide) spaced about 600 feet apart that span Antsell Rock Creek and Servo Creek. Another bridge (10' high, 12' wide) spans Hurkey Creek. These creeks feed expansive wetland habitats that provide habitat for a number of aquatic and semi aquatic species.



Example of a concrete box culvert on Highway 74 in Garner Valley.


A Linkage Design for the
Palomar - San Jacinto - Santa Rosa
Connection
Linkage Design
Conservation Lands
Department of Defense Lands
Tribal Lands
National Monument
Water Body
River or Stream
Highway or Major Road
County Boundary
1:375,000
0 2 4 8 12 16 Kilometers
0 2 4 8 12 16 Miles
SAN BERNARDINO
NATIONAL
FOREST
San Jacinto Peak
San Jacinto Mountains
Santa Rosa
San Jacinto Mountains
National Monument
Santa Rosa
Mountains
Cabuilla Indian
Reservation
CLEVELAND
NATIONAL
FOREST
Palomar Mountains
ANZA BORREGO
DESERT
STATE PARK
Los Coyotes Indian
Reservation
Riverside Co
San Diego Co
Lake Hemet
Little Cabuilla Mtn
Cabuilla Mountain
Billy Goat Mountain
Iron Spring Mountain
Beauty Mountain
Palm Canyon
Deep Canyon
Wilson Creek
Cabuilla Valley
Tule Valley
Copper Canyon
74
371
79
15
10
111

Santa Ana-Palomar Connection

This linkage joins the Santa Ana Mountains and its coastal lowlands to the Palomar Mountains and inland ranges of San Diego County, serving to connect extensive natural areas of Cleveland National Forest (CNF) and Camp Pendleton, the largest contiguous block of coastal habitat remaining in the ecoregion. The Linkage Design is a band of habitat roughly 21 miles in width and 75 miles long that extends eastward from the CNF Trabuco Ranger District, and Camp Pendleton to the western and northern boundaries of the CNF Palomar Ranger District. The Santa Margarita River, the longest intact stream corridor in southern California, winds through the linkage; it crosses I-15 and continues up Temecula Creek and across Vail Lake until it reaches the CNF Palomar Ranger District via the Arroyo Secco, Kolb, and Temecula creek drainages. This connection serves aquatic species (arroyo and southern steelhead trout), but also benefits semi-aquatic and terrestrial species that move along canyon bottoms (e.g., western pond turtle, pale swallowtail, or mountain lions). Approximately 1/3 of the 67,888 acres in the Linkage Design are protected from conversion to urban or agricultural use.



Looking west across Interstate 15, toward the Santa Ana Mountains from Sage Scrub Ridge in the Palomar Mountains.

Interstate 15 is the only major freeway in the Linkage Design, and currently lacks crossing structures adequate to accommodate species moving through upland and aquatic habitats. Other paved roads in the Linkage Design are two lanes in width (including Old Highway 394 and the Pala Temecula Road) and show lower levels of use than I-15 or State Route 79. Fisher and Crooks (2001) showed that roads in the linkage area vary substantially in their danger to wildlife depending upon level of use. Larger mammals and low flying birds and insects often are able to

successfully cross roads of this type, but small mammal and reptile mortalities are fairly high (Fisher and Crooks 2001).

The bridge spanning Temecula Creek would permit use by both upland and riparian focal species, but the adjacent Red Hawk Golf Course and commercial and residential developments block movements to and from the bridge on the eastern side. Further upstream there are significant gaps in natural habitats creating a dead-end for species moving eastward along Temecula Creek. We recommend restoring riparian vegetation from the Temecula Creek crossing to natural habitats in the Palomar Mountains and restoring a chaparral connection near the bridge on the east side of I-15 that extends to the ridgeline above the golf course, and removing existing fences and any other barriers. There are also three corrugated metal pipes about three feet in diameter and roughly 144 feet in length but curvature in the pipes prevents visibility to the other side. We recommend these pipes be replaced with expansive underpasses with earthen substrate flooring that are large enough to provide visibility to the other side. Appropriate fencing should be used to guide animals to these passageways. Due to the significance of I-15 as a barrier and the compromised function of the Temecula Creek bridge, a top priority for restoring linkage function is to install a habitat overpass just north of the Border Patrol checkpoint. Beier and Barrett (1993) identified this site as the "most critical link". During their study, three lions were killed but a juvenile successfully crossed at this location. They also concluded that this connection must be secured for immigration of lions from the Palomar Range to prevent the extinction of the population in the Santa Ana Mountains.



Temecula Creek passing through two extended bridges on Interstate 15.

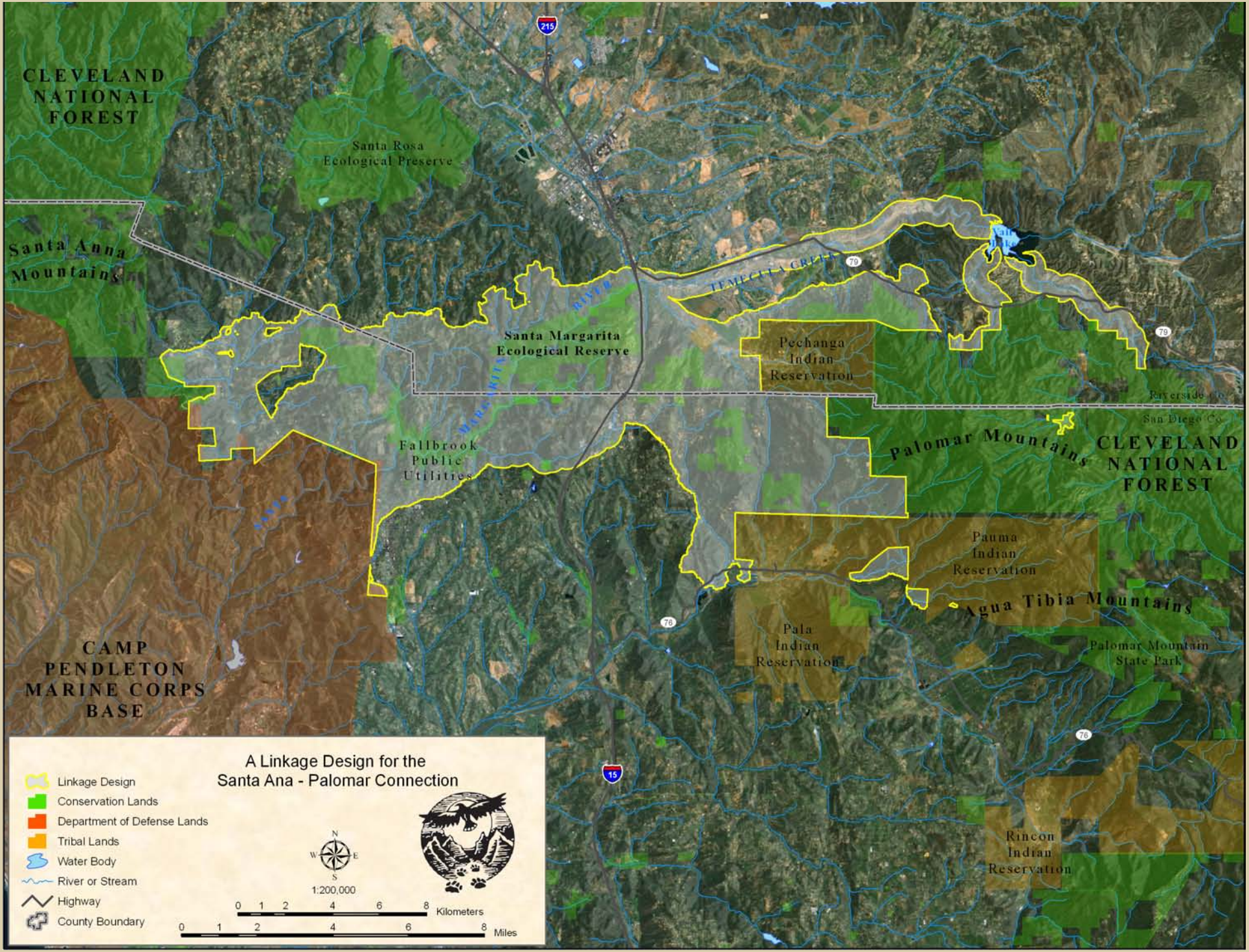


Potential site for vegetated land bridge on Interstate 15; near call box 15-16.

State Highway 79 is a two-lane high-speed road with heavy levels of traffic that crosses key riparian drainages in the eastern portion of the linkage. It crosses Kolb Creek, Arroyo Secco, and Temecula creek drainages above Vail Lake near the Palomar Ranger District. These bridges vary in height from 6 to 30 feet, and all have well-developed riparian and upland vegetation in the vicinity, and provide good visibility to the other side. These bridges provide passageways across the 79 for various species, but use of all of the bridges could be enhanced by installing fencing to guide animals towards the structures.



Kolb Creek bridge on the SR-79.


CLEVELAND NATIONAL FOREST
Santa Rosa Ecological Preserve
Santa Anna Mountains
Santa Margarita Ecological Reserve
Pechanga Indian Reservation
Fallbrook Public Utilities
Palomar Mountains
CLEVELAND NATIONAL FOREST
Pauma Indian Reservation
Agua Tibia Mountains
Pala Indian Reservation
Palomar Mountain State Park
CAMP PENDLETON MARINE CORPS BASE
Rincon Indian Reservation
A Linkage Design for the
Santa Ana - Palomar Connection
Linkage Design
Conservation Lands
Department of Defense Lands
Tribal Lands
Water Body
River or Stream
Highway
County Boundary
1:200,000
0 1 2 4 6 8 Kilometers
0 1 2 4 6 8 Miles

Peninsular-Borrego Connection

This linkage connects the coastal habitats of Cleveland National Forest and Cuyamaca Rancho State Park in the Peninsular Ranges with the desert communities of Anza Borrego Desert State Park. The Linkage Design encompasses 127,788 acres, of which approximately 36% (45,521 acres) currently enjoys some level of conservation protection, mostly in land administered by US Forest Service, California State Parks, Bureau of Land Management, Department of Fish and Game, County of San Diego, and The Nature Conservancy. Portions of the Santa Ysabel and Mesa Grande reservations also occur in the linkage.

The Linkage Design has three major strands. The most northerly strand extends from the Palomar and Aguanga mountains of Cleveland National Forest, encompasses habitats surrounding Lake Henshaw in the Warner Basin, the riparian habitats along the San Luis Rey River, San Ysidro, Buena Vista, and Matagual Creeks and the mixed chaparral and oak woodland habitats in the San Felipe Hills near Pinyon Ridge in Anza-Borrego Desert State Park. This strand was delineated by the landscape permeability analysis for badger but also provides the largest core areas of suitable habitat for grasshopper sparrow and black-tailed jackrabbit.



Looking southeast down Banner Canyon with Granite Mountain in Anza Borrego Desert State Park in the distance.

The central strand extends from Black Mountain in Cleveland National Forest and encompasses riparian and upland habitats along Bloomdale, Witch, and Santa Ysabel creeks, Santa Ysabel Valley, the southern extent of the Volcan Mountains, Banner Canyon, and San Felipe Creek, and enters Anza-Borrego Desert State Park between Pinyon Ridge and Grapevine Mountain. This strand was delineated by the landscape permeability analysis for mountain lion but is also intended to serve other species such as mule deer, badger, and granite night lizard. Santa Ysabel Creek is especially important for species requiring a contiguous riparian connection.

The southern strand extends from Sutherland Lake and follows the belt of oak savanna, and grassland habitats in the Ballena Valley and the riparian habitats of Witch Creek to the upper San Diego River Gorge, and then up Sentenac Creek to habitats around Lake Cuyamaca in Cuyamaca Rancho State Park and the desert riparian habitats of Vallecito Wash in Anza-Borrego Desert State Park. This strand was defined by the landscape permeability analysis for mule deer.

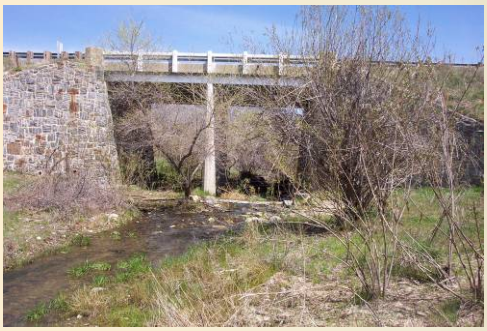
State Routes 78 and 79 are the major transportation routes and pose the most substantial barriers to movement. SR-79 bisects the linkage for a distance of roughly 27 miles, while SR-78 passes through the central and southern strands of the linkage.

A well-designed bridge conveys flows of Canada Verde Creek under SR-79 near Warner Springs. Coast live oak riparian forest lines the creek with grasslands south of the SR-79 and redshank chaparral the dominant community north of the highway. This bridge is well-suited as a wildlife crossing, as the stream draws animals to the canyon. The Pacific Crest Trail also utilizes this structure, as it passes through the northern strand of the linkage, between Anza-Borrego Desert State Park and Forest Service lands north of SR-79.



Bridge for Canada Verde Creek and the PCT under SR-79.

The least cost corridor for mountain lion crossed SR-79 using Santa Ysabel Creek and researchers have documented lions using the creek as a travel route (Sweanor et al. 2003). There is a well-designed bridge that has natural flooring, provides good visibility, and measures about 30 feet high, 40 feet wide, and 22 feet long. Species that utilize riparian, grassland, or oak savanna habitats (e.g., badger, mule deer, black-tailed jackrabbit, and grasshopper sparrow) will benefit from this connection. Santa Ysabel Creek provides the most direct riparian connection between targeted areas, and most of the canyon is already protected.

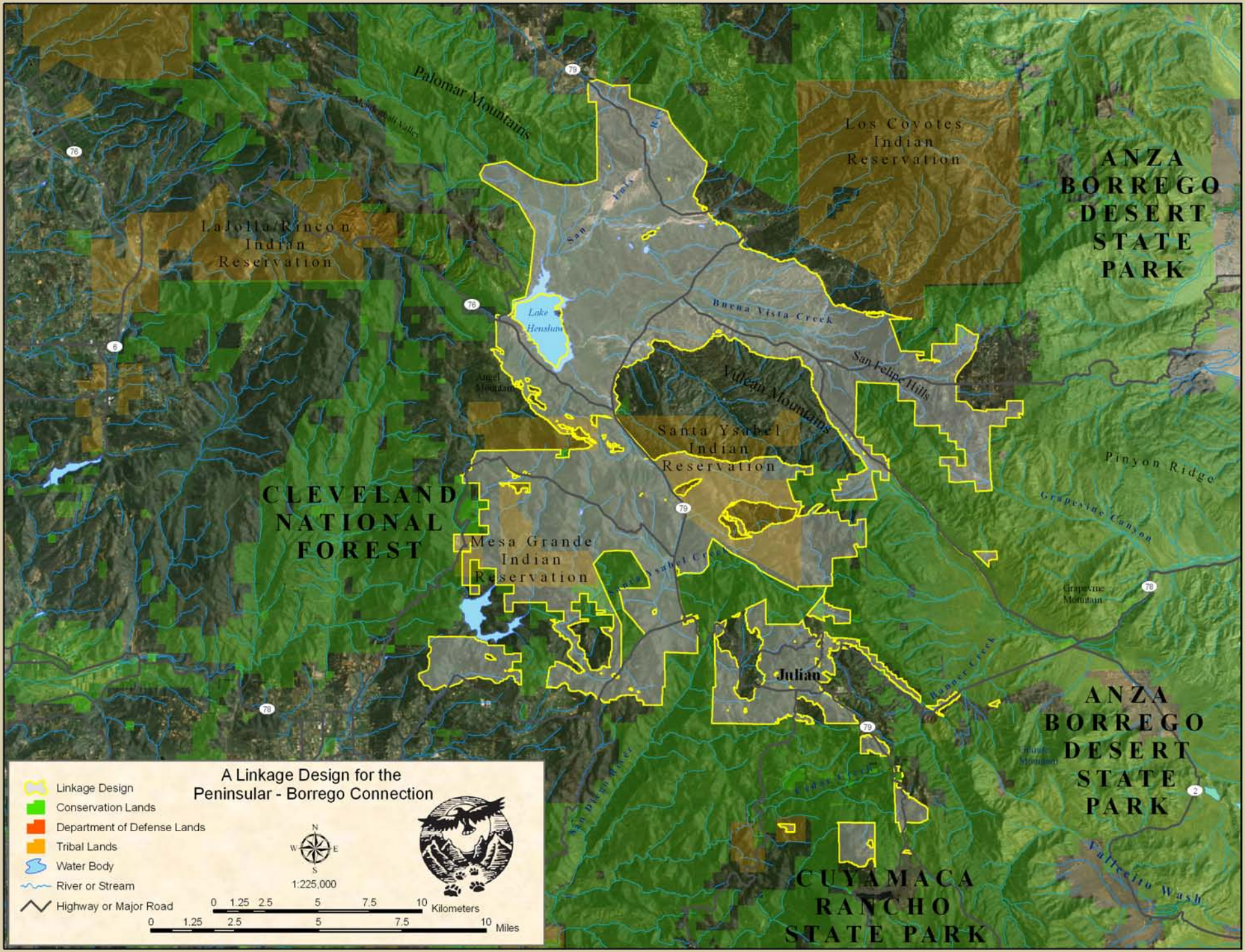


Bridge for Santa Ysabel Creek on SR-79.

The bridge for San Felipe Creek is roughly 30 feet high, 325 feet wide and 30 feet long. San Felipe Creek is designated as a National Natural Landmark, one of the last natural perennial desert streams that supports an incredible diversity of species. Many focal species have been detected, including mountain lion, badger, mule deer, black-tailed jackrabbit, granite night lizard, golden eagle, and black brant. Most of the habitat in the San Felipe Hills and Valley is already conserved. S2 runs along San Felipe Creek at the base of the San Felipe Hills, connecting SR-78 and Sr-79. S22 passes through the northern strand of the linkage, and stretches from the community of Borrego Springs to the base of the San Felipe Hills. Both of these scenic highways are currently one lane in each direction and almost entirely at grade. Any road improvements should incorporate regularly spaced culverts to increase movement opportunities for smaller species and reduce roadkill.



San Felipe Creek flows beneath SR-78 through a bridge that provides passage to numerous species.


A Linkage Design for the
Peninsular - Borrego Connection
Linkage Design
Conservation Lands
Department of Defense Lands
Tribal Lands
Water Body
River or Stream
Highway or Major Road
1:225,000
0 1.25 2.5 5 7.5 10 Kilometers
0 1.25 2.5 5 7.5 10 Miles
Palomar Mountains
Los Coyotes Indian Reservation
ANZA BORREGO DESERT STATE PARK
La Jolla/Rincon Indian Reservation
Lake Henshaw
Buena Vista Creek
San Felipe Hills
Vulcan Mountains
Santa Ysabel Indian Reservation
Pinyon Ridge
Grapevine Canyon
CLEVELAND NATIONAL FOREST
Mesa Grande Indian Reservation
Julian
Granite Mountain
Volcan Mountain
CUYAMACA RANCHO STATE PARK
Vallecito Wash

Missing Linkages along the U.S.-México Border

Linkages along the U.S.-México border in San Diego and Imperial counties are being implemented as part of the *Las Californias Binational Conservation Initiative* (LCBCI; www.consbio.org/cbi/projects), led by The Nature Conservancy, Conservation Biology Institute, Pronatura, and Terra Peninsular, with assistance from the Resources Legacy Fund Foundation, Back Country Land Trust, The Conservation Fund, California State Parks, Bureau of Land Management, and others. As a result of the LCBCI, priority properties have been identified and approximately 3,500 acres have been conserved to date (representing an investment of over $8 million in private, state, and federal funds), and LCBCI priorities have been included in several agency planning documents. The California Biodiversity Council (CBC) has embraced LCBCI and established a border work group, comprised of agencies and NGOs from both sides of the border, which is collaborating on implementation. We are also working with the San Diego Natural History Museum, U.S. and Mexican agencies, and academic institutions on a binational expedition to increase our understanding of resources in the study area on both sides of the border.

Otay Mountain—Cerro San Ysidro linkage

Otay Mountain in California and Cerro San Ysidro in Baja California represent *sky islands* of endemic plant species and represent the last cross-border coastal sage scrub linkage. This linkage continues along Cottonwood Creek to the Laguna Mountains in the Cleveland National Forest. Completion of this linkage will contribute to the recovery of 22 federally and state listed species and secure protection of some of the most rare and floristically diverse vegetation communities on the planet.

La Posta linkage

This linkage serves to connect the Campo Valley in San Diego County with the El Hongo Valley in Baja California. It occurs in an ecological transition area between the coast and the desert, and between mountain and inland valley biomes. Completing this linkage, by conserving a series of small core areas, will decrease fragmentation, maintain a sanctuary of wilderness values at the edge of an urban metropolis, and ensure conservation across a range of elevational gradients that will enhance the resilience of existing protected lands to global climate change.

Parque-to-Park linkage

This linkage provides a connection between Anza-Borrego Desert State Park in San Diego and Imperial counties, and Parque Constitución de 1857 in Baja California. This is a truly continental-scale linkage along the transboundary region of the Peninsular Ranges, thus ensuring cross-border connectivity through the eastern edge of the South Coast Ecoregion and the Sonoran Desert. Completing this linkage ultimately will allow the endangered Peninsular Bighorn Sheep to repopulate the Sierra Juárez in northern Baja California and encourage binational collaboration in managing bighorn sheep populations on both sides of the border.

Following are a few of the primary implementation objectives:

- Work toward creation of a binational park that links Parque Constitución de 1857 in the Sierra Juárez in Baja California with public wilderness areas in San Diego County.
- Work toward creation of a cross-border linkage between Tijuana and Tecate / San Diego and Campo.
- Conserve the Cottonwood Creek corridor between Cerro San Ysidro, Otay Mountain, and the Laguna Mountains.
- Provide technical support to Mexican partners in conserving large, intact natural areas and working landscapes within Baja California.

Recommendations to Reduce the Effects of Roads: Although road-widening projects and new roads generally increase vehicle traffic, they need not result in more wildlife/vehicle collisions, or a decrease in animal movements. Transportation projects present the greatest opportunity to provide crossing structures to accommodate wildlife movement. Because most of California's roads were not originally designed to accommodate wildlife movement, road improvement projects can dramatically restore permeability. Conversely, we can expect slower progress making canals and railroads more wildlife-friendly because these structures are not as regularly upgraded. Nonetheless, most structures are eventually upgraded, creating opportunities to facilitate connectivity, thus it is critical that planners and engineers be aware of the need for connectivity.

Wildlife crossing structures that have been used in North America and Europe to facilitate movement through landscapes fragmented by roads include wildlife overpasses, bridges, culverts, and pipes. While many of these structures were not originally constructed with ecological connectivity in mind, many species benefit from them (Clevenger et al. 2001; Forman et al. 2003). No single crossing structure will allow all species to cross a road. For example rodents prefer to use pipes and small culverts, while bighorn prefer vegetated overpasses or open terrain below high bridges. A concrete box culvert may be readily accepted by a mountain lion or bear, but not by a deer or bighorn sheep. Small mammals, such as deer mice and voles, prefer small culverts (McDonald & St Clair 2004).



Elk using wildlife overpass, Banff National Park, Canada

Although some documents refer to such structures as "corridors" or even "linkages," we use these terms in their original sense to describe the entire area required to link the landscape and facilitate movement between large wildland blocks. Crossing structures represent only small portions, or choke points, within an overall habitat linkage or movement corridor. Properly designed crossing structures are a means of making barriers more permeable to wildlife movement. However, investing in specific crossing structures may be meaningless if essential lands in the linkage are left unprotected. Thus it is essential to keep the larger landscape context in mind when discussing existing or proposed structures to cross movement barriers. This broader context also allows awareness of a wider variety of restoration options for maintaining functional linkages.

Based on the small but increasing number of scientific studies on wildlife use of highway structures, we offer these general standards and guidelines for *all* existing and future crossing structures intended to facilitate wildlife passage across highways, railroads, and canals.

- **Multiple crossing structures should be constructed to provide connectivity for all species likely to use a given area** (Little 2003). For deer or other ungulates, an open

structure such as a bridge is crucial. For medium-sized mammals, black bear, and mountain lions, large box culverts with natural earthen substrate flooring are optimal (Evink 2002). For small mammals, pipe culverts from 0.3m – 1 m in diameter are preferable (Clevenger et al. 2001; McDonald & St Clair 2004).

- **At least one crossing structure should be located within an individual's home range**. Because most reptiles, small mammals, and amphibians have small home ranges, metal or cement box culverts should be installed at intervals of 150-300 m (Clevenger et al. 2001). For ungulates (deer, bighorn) and large carnivores, larger crossing structures such as bridges, viaducts, or overpasses should be located no more than 1.5 km (0.94 miles) apart (Mata et al. 2005; Clevenger and Wierzchowski 2006).

- **Suitable habitat for species should occur on both sides of the structure** (Ruediger 2001; Barnum 2003; Cain et al. 2003; Ng et al. 2004). "Crossing structures will only be as effective as the land and resource management strategies around them" (Clevenger et al. 2005).

- **Whenever possible, suitable habitat should occur *within* the crossing structure.** This can best be achieved by having a bridge high enough to allow enough light for vegetation to grow under the bridge, and by making sure that the bridge spans upland habitat that is not regularly scoured by floods. Where this is not possible, rows of stumps or strands under large span bridges can provide cover for smaller animals such as reptiles, amphibians, rodents, and invertebrates; regular visits are needed to replace artificial cover removed by flood. Within culverts, earthen floors are preferred by mammals and reptiles.

- **Structures should be monitored for, and cleared of, obstructions that impede movement.** Many box culverts have large accumulations of branches, Russian thistle, sand, or garbage that impede animal movement, while bridged undercrossings rarely have these problems.

- **Fencing should direct animals towards crossing structures** (Yanes et al. 1995). In Florida, construction of a wall to guide animals into a culvert system resulted in 93.5% reduction in roadkill, and also increased the total number of species using the culvert from 28 to 42 (Dodd et al. 2004). One-way ramps on roadside fencing can allow an animal to escape if it is trapped on a road (Forman et al. 2003).

- **Raised sections of road discourage animals from crossing roads, and should be used when possible to encourage animals to use crossing structures**. Clevenger et al. (2003) found that vertebrates were 93% less susceptible to road-kills on sections of road raised on embankments, compared to road segments at the natural grade of the surrounding terrain.

- **Manage human activity near each crossing structure**. Clevenger & Waltho (2000) suggest that human use of crossing structures should be restricted and foot trails relocated away from structures intended for wildlife movement. However, a large crossing structure (viaduct or long, high bridge) should be able to accommodate both recreational and wildlife use. At a minimum, nighttime human use of crossing structures should be restricted.

- **Design culverts specifically to provide for animal movement**. Most culverts are designed to carry water under a road and minimize erosion hazard to the road. Culvert designs adequate for transporting water often have pour-offs at the downstream ends that

prevent wildlife usage. At least one culvert every 150-300m of road should have openings flush with the surrounding terrain, and with native land cover up to both culvert openings, as noted above.

Recommendations to Reduce the Effects of Rail Lines: We recommend a policy of using any railroad realignment as an opportunity not simply to mitigate loss of wildland connectivity, but to improve it. Ameliorating the adverse affects of railroads is similar to that for roads, providing viaducts, bridged underpasses, and tunnels (Reed and Schwarzmeier 1978, Borowske and Heitlinger 1981, Forman 1995).

- We recommend that crossing structures should be sited at least every 1.5 to 2 km.
- We suggest structures for rail lines be aligned with crossing structures on freeways.
- We encourage crossing structures associated with rail lines be integrated with sound walls to reduce noise.
- Structures should be integrated with fences where beneficial to guide animals toward crossing structures. Fencing can be permeable to humans and larger animals, and would not be needed where steep cut and fill slopes already divert animals toward structures.

Recommendations to Reduce the Effects of Streams Barriers: Since 80% of terrestrial vertebrate species depend on riparian systems (Kreuper 1992), it is critical to maintain these communities. Measures to minimize development impacts on aquatic habitats typically focus on establishing riparian buffer zones (Barton et al. 1985, Allan 1995, Willson and Dorcas 2003). Buffers must contain enough upland habitat to maintain water-quality and habitat characteristics essential to the survival of many aquatic and semiaquatic organisms (Brosofske et al.1997, Willson and Dorcas 2003). To enhance species use of riparian habitats, we recommend:

- Restore riparian vegetation in all drainages and upland vegetation within 0.6 miles of streams and rivers to encourage plant and animal movement and increase water quality.
- Investigate historic flow regimes and develop surface and groundwater management programs to restore and recover properly functioning aquatic/riparian conditions.
- Remove exotic plants (e.g., tamarisk) and animals (e.g., bullfrogs, African clawed frogs) from washes, streams and rivers. Work with relevant agencies and organizations to survey for invasive species and develop a comprehensive removal strategy.
- Enforce regulations protecting streams and stream vegetation from illegal diversion, alteration, manure dumping, and vegetation removal.
- Enforce regulations restricting farming, gravel mining, suction dredging, and building in streams and floodplains.
- Work with the Resource Conservation Districts to help establish use of Best Management Practices for rural communities in the linkage designs and surrounding communities.
- Support efficient water use and education programs that promote water conservation.
- Discourage development in flood prone areas and prevent the construction of concrete-banked streams and other channelization projects.

- Support the protection of riparian and adjacent upland habitats on private lands. Pursue cooperative programs to improve conditions in riparian and upland habitats.

Recommendations to Reduce the Effects of Mining: Mining operations can be modified with actions that reduce the affects of these industrial activities. Preventing any further mining operations in key areas of a Linkage Design through administrative withdrawals will have the greatest effect on preserving linkage function. Existing mining operations can be targeted for regulatory actions that reduce the effects of these industrial activities. These include, limiting noise from blasting, minimizing night lighting, reducing traffic in sensitive areas or constriction points, monitoring water quality and quantity, minimizing the use of harmful chemicals, and increasing enforcement of existing regulations. The California Surface Mining and Reclamation Act (1975) require that land used in mining operations be restored once operations have ceased.

Recommendations to Reduce the Effects of Urban Barriers: Urban developments, unlike roads, create movement barriers that cannot be readily removed, restored, or mitigated. Preventing urban developments in key areas through acquisition or conservation easements is therefore the strongest option. Mitigation for existing urban developments focuses on designing and managing buffers to reduce penetration of undesirable effects into natural areas (Marzluff and Ewing 2001). Management in buffers can include fencing in pets, reducing human traffic in sensitive areas or constriction points, limiting noise and lighting, reducing traffic speeds, minimizing use of irrigation, maximizing outdoor water use efficiency measures, encouraging the planting of locally native vegetation, minimizing the use of pesticides, poisons and other harmful chemicals, and increasing enforcement of existing regulations.

Recommendations to Reduce the Effect of Agricultural Barriers: Agricultural practices remove native vegetation, require significant water resources, and increase nutrient runoff into streams, and support invasions by exotic species. Waters draining from these developments show elevated levels of nutrients and particles. Many drainages that were once ephemeral become perennial (Fisher and Crooks 2001) and are capable of supporting exotic species such as exotic fish, bullfrogs and giant reed. As with urban developments, acquisition or conservation easements with willing landowners will have the greatest effect on preserving linkage function from agricultural impacts. For existing developments, a variety of Best Management Practices can reduce nutrient runoff and erosion. These include the timing and types of nutrient use, use of native vegetation to absorb surface and subsurface runoff, dirt road design, and soil management. In addition, the pattern of agricultural developments can have a significant affect on species movements. We provide the following initial recommendations to prevent or mitigate the effects of agriculture in the linkage design areas:

- Discourage further agricultural development by purchasing lands with natural vegetation, or developing easements with willing landowners.

- Restore agricultural lands in areas of a linkage where natural habitats have been severely constricted. Where possible, restore a one kilometer wide isthmus of habitat through adjacent agricultural developments.

- Work with The Regional Water Quality Control Board's Total Maximum Daily Load plans to evaluate the cause the water quality deterioration and enact an implementation plan to return water quality to targeted water quality values.

- Encourage research on agriculture that specifically identifies solutions to elevated nutrient runoff, erosion, and effects of perennializing streams.

Recommendations to Reduce the Effects of Recreation: If recreational activities are effectively planned, developed, managed, and monitored, most negative impacts can be avoided or minimized by limiting types of use, directing recreational activities away from particular locations, sometimes only for particular seasons, and with reasonable precautions. We provide the following recommendations:

- Monitor recreational use to provide a baseline for decisions regarding levels, types, and timing of recreational use.
- Collect data on special status species, species movements, and vegetation disturbance in areas of high recreational activity.
- Develop and conduct multi-lingual outreach programs to recreational users on how to lessen impacts in sensitive areas.
- Close, obliterate, and restore any unauthorized off-road vehicle routes.
- Enforce leash laws so that dogs are under restraint at all times.

Translating Plans into Action

Although South Coast Missing Linkages rigorous, detailed designs are central to the approach, the project will not be complete with the publication of the linkage designs. The success of South Coast Missing Linkage will be measured by our effectiveness at *translating our vision of a connected landscape into land-saving actions.* With the completion of the planning and design phase comes the need to disseminate and institutionalize the results and build and support Linkage Implementation Coalitions to undertake the on-the-ground work to conserve our South Coast linkages.

Institutionalization of Linkage Designs

Partners in the South Coast Missing Linkages initiative are designing a strategic outreach plan that will a) focus broad incorporation of the Linkage Designs into relevant governing instruments (e.g. general plans, HCPs, local ordinances, CEQA); b) establish a public expectation of linkage protection; c) organize new constituencies and empower old partners; and d) utilize the unique abilities of each constituency to institutionalize support for these linkages. We are also working with our partners to develop and implement communication strategies to broaden the dissemination of the designs and inform the public and decision makers as to the importance of protecting these linkages.

The South Coast Missing Linkages initiative has already strongly influenced a number of important local, regional, and statewide conservation planning efforts. One direct result of our broad collaboration is the integration of the South Coast Missing Linkages into policy decisions to improve and enforce protection of these regionally important habitat linkages. For example, the four southern California Forests (Los Padres, Angeles, San Bernardino, and Cleveland) recently finalized their Resource Management Plans and identified connecting the four forests to the existing network of protected lands as one of the key strategies for protecting biodiversity in the forests. South Coast Missing Linkages was also recently acknowledged as a vital strategy for improving the status of wildlife in the state by the California Department of Fish and Game in a report prepared for the National State Wildlife Grant Program. *California Wildlife: Conservation Challenges* includes the following as one of its Recommended Region-Specific Conservation Actions:

> "To address regional habitat fragmentation, federal, state, and local agencies, along with nongovernmental conservation organizations, should support the protection of the priority wildland linkages identified by the South Coast Missing Linkages project."

South Coast Wildlands is representing South Coast Missing Linkages in the Western Governors Wildlife Corridors Initiative (http://www.we stgov.org/wga/initiatives/corridors/index.htm). The governors of the 19 Western States passed a unanimous resolution in 2007 that all future highways, canals, energy developments, and new land-use plans should be consistent with conservation of important wildlife corridors. Although this will be a broad-brush approach, it can profoundly impact the face of the conserved landscape of the Western United States.

Building Implementation Coalitions

The importance of investing in building and maintaining relationships cannot be over-emphasized. Development of technical plans to overcome barriers to animal movement must be matched by efforts to build and maintain linkages among all the players. Partners across the region have already heeded the call to action! The following describes a few of the implementation activities underway to translate our plans into land-saving actions:

In the Santa Ana-Palomar Mountains Linkage, we have been working with the South Coast Conservation Forum, a consortium of county, state, and federal agencies, universities, and non profits formed to advise the Department of Defense on reducing urban encroachment and conflicts with military training maneuvers on Camp Pendleton. South Coast Missing Linkages information provided to the Forum ensured that this linkage was recognized as important to mitigating long-term impacts to sensitive species. The Linkage Design has been used to target Defense Authorization Act funds that will protect thousands of acres within the linkage. In addition, this linkage overlaps planning boundaries for two Multiple Species Conservation Plans, the Western Riverside Multiple Species Habitat Conservation Plan and the Northern San Diego Multiple Species Conservation Plan. Roughly 70% of the linkage in Riverside County and 92% in San Diego County are targeted for conservation by these NCCPs. A Conceptual Area Protection Plan (CAPP) has also been completed which will target state land acquisition funds.

To conserve the linkage between the San Gabriel Mountains and the Castaic Ranges of the Angeles National Forest, we are partnering with Upper Santa Clara Biodiversity Working Group, whose members include Forest Service, Bureau of Land Management, Fish and Wildlife Service, Department of Fish & Game, City of Santa Clarita, Santa Monica Mountains Conservancy (SMMC), Rivers and Mountains Conservancy, Wetlands Recovery Project, and The Nature Conservancy (TNC). The Linkage Design helped the agencies focus on the western part of the linkage; the most important area for promoting wildlife movement. The City of Santa Clarita is focusing its capital improvement project mitigation acquisitions in the Linkage Design even though this area is outside their city limits. The Forest Service is working with National Park Service to reroute the Pacific Crest Trail, now threatened by encroaching development, into our linkage design. A CAPP has also been completed, which will target state land acquisition funds. The Nature Conservancy, Rivers and Mountains Conservancy, & Santa Monica Mountains Conservancy are working with the Land Agent at Wildlife Conservation Board to acquire land in the linkage.

To maintain connectivity between the Santa Monica Mountains and Sierra Madre Ranges, we are working with the National Park Service, Caltrans, SMMC, TNC, Trust for Public Land, and Los Angeles and Ventura Counties. Caltrans used the Linkage Design to identify mitigation opportunities along State Route 118, and has initiated a working group for this transportation improvement project. It is our hope that this working group will evolve into an implementation coalition that covers the entire linkage area.

Exporting the South Coast Missing Linkages Model

The success with which South Coast Missing Linkages has been met propels us to work with our partners beyond the South Coast Ecoregion to identify and design landscape linkages across the state, the west, and the nation. To our great excitement, the state of Arizona has completely adopted the South Coast Missing Linkages methodology for designing landscape linkages, and Colorado has partially adopted it.

The Vision

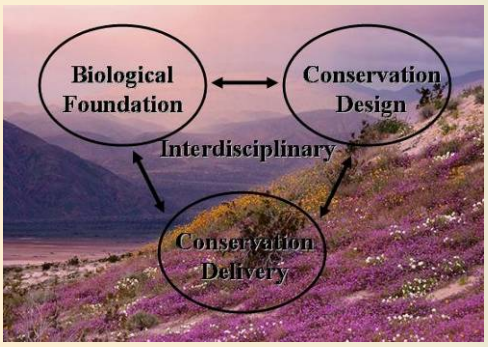
The ecological, educational, recreational, and spiritual values of protected wildlands in the South Coast Ecoregion are immense. These conserved lands also represent an investment of tens of billions of dollars. We need to ensure the ecological health of this investment by securing these linkages. These Linkage Designs represent opportunities to protect truly functional landscape-level connections among these wildlands. If implemented, our plan would not only permit movement of individuals and genes, but should also conserve large-scale ecosystem processes that are essential to the integrity of existing conservation investments throughout the region.

Appendix A
Conservation Planning Approach

The goal of linkage conservation planning is to identify specific lands that must be conserved to maintain or restore functional connections for all species or ecological processes of interest, generally between two or more protected core habitat areas. Our approach can be generally summarized as follows:

1) *Focal Species Selection:* select focal species from diverse taxonomic groups to represent a diversity of habitat requirements and movement needs.
2) *Landscape Permeability Analysis:* conduct landscape permeability analyses to identify a zone of habitat that addresses the needs of multiple species potentially traveling through, or residing in the linkage.
3) *Patch Size & Configuration Analysis:* use patch size and configuration analyses to identify the priority areas needed to maintain linkage function.
4) *Field Investigations:* conduct fieldwork to ground-truth results of analyses, identify barriers, and document conservation management needs.
5) *Linkage Design:* compile results of analyses and fieldwork into a detailed comprehensive report with recommended conservation and restoration opportunities.

Our approach has been highly collaborative and interdisciplinary (Beier et al. 2006). We followed Baxter (2001) in recognizing that successful conservation planning is based on the participation of experts in biology, conservation design, and implementation in a reiterative process. To engage regional biologists and planners early in the process, we held a series of habitat connectivity workshops in 2002. The workshops engaged over 270 participants representing over 126 different agencies, academic institutions, conservation organizations, and community groups. Our partners come from wide and varied backgrounds and include scientific and academic institutions, federal land management agencies, state agencies, local electeds, and conservation non-government organizations.

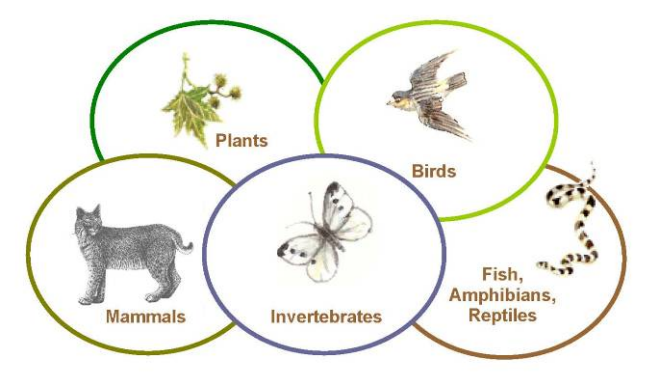


Successful conservation planning requires an interdisciplinary and reiterative approach among biologists, planners, and activists (Baxter 2001).

Focal Species Selection

Although our ultimate goal is to conserve ecosystem function, we designed linkages to serve the needs of particular species. We selected species that covered a cover a wide array of habitat and movement needs in the region, so that planning adequate linkages for these species is expected to cover connectivity needs for the *ecosystems* they represent. We identified species from several taxonomic groups (plants, birds, mammals, invertebrates, fish, amphibians, and reptiles with 109 focal species selected from across the priority linkages. Our suite of focal species included a few "orthogonal" species, i.e., species that occur within the linkage but not necessarily in the core areas. Planning for such species can help ensure that linkages maintain ecological integrity and are not sterile gauntlets through which other species must pass. Thus, although most of our focal species were "species that need the linkage" (to pass between core areas), the orthogonal taxa represented "species that the linkage needs" (to ensure its integrity).

A taxonomically diverse group of focal species was selected to represent species that are sensitive to habitat loss and fragmentation and to represent the diversity of ecological interactions that can be sustained by successful linkage design. The focal species approach (Beier and Loe 1992) recognizes that species move through and utilize habitat in a wide variety of ways. Focal species were selected because their life history characteristics render them either particularly sensitive to habitat fragmentation or otherwise meaningful to linkage design.

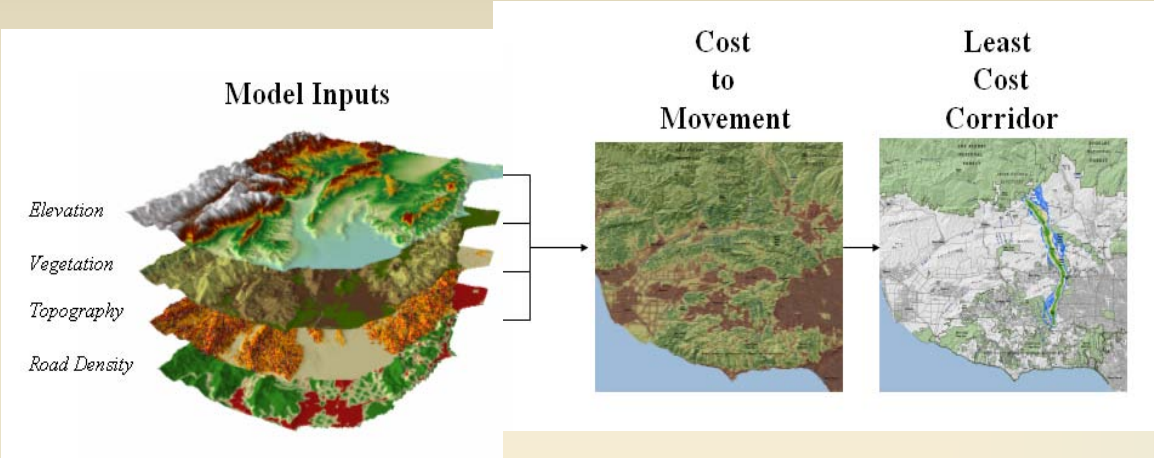


Landscape Permeability Analysis

Landscape permeability analysis is a GIS technique that models the relative cost for a species to move between core areas based on how each species is affected by habitat characteristics, such as slope, elevation, vegetation composition, and road density. This analysis identifies a least-cost corridor, or the best potential route for each species between protected core areas (Walker and Craighead 1997, Craighead et al. 2001, Singleton et al. 2002). The purpose of the analysis was to identify land areas, which would best accommodate all focal species living in or moving through the linkage (Beier et al. 2006). Species used in landscape permeability analysis must be carefully chosen, and were included in this analysis only if:

- We know enough about the movement of the species to reasonably estimate the cost-weighted distance using the data layers available to our analysis.
- The data layers in the analysis reflect the species' ability to move.
- The species occurs in both cores (or historically did so and could be restored) and can potentially move between cores, at least over multiple generations.
- The time scale of gene flow between core areas is shorter than, or not much longer than, the time scale at which currently mapped vegetation is likely to change due to disturbance events and environmental variation (e.g. climatic changes).

The relative cost of travel was assigned for each species based upon its ease of movement through a suite of landscape characteristics (vegetation type, road density, and topographic features). The following spatial data layers were assembled at 30-m resolution: vegetation, roads, elevation, and topographic features. We derived four topographic classes from elevation and slope models: canyon bottoms, ridgelines, flats, or slopes. Road density was measured as kilometers of paved road per square kilometer. Within each data layer, we ranked all categories between 1 (preferred) and 10 (avoided) based on focal species preferences as determined from available literature and expert opinion regarding how movement is facilitated or hindered by natural and urban landscape characteristics. Each input category was ranked and weighted, such that: (Vegetation * w%) + (Road Density * x%) + (Topography * y%) + (Elevation * z%) = Cost to Movement, where w + x + y + z = 100%.



Permeability Model Inputs: elevation, vegetation, topography, and road density. Landscape permeability analysis models the relative cost for a species to move between core areas based on how each species is affected by various habitat characteristics.

Weighting allowed the model to capture variation in the influence of each input (vegetation, road density, topography, elevation) on focal species movements. A unique cost surface was thus developed for each species. A corridor function was then performed in GIS to generate a data layer showing the relative degree of permeability between core areas.

For each focal species, the most permeable area of the study window was designated as the least-cost corridor. The least-cost corridor output for all focal species was then combined to generate a Least Cost Union. The biological significance of this Union can best be described as the zone within which all modeled species would encounter the least energy expenditure (i.e., preferred travel route) and the most favorable habitat as they move between targeted protected areas. The output does not identify barriers (which were later identified through fieldwork), mortality risks, dispersal limitations or other biologically significant processes that could prevent a species from successfully reaching a core area. Rather, it identifies the best zone available for focal species movement based on the data layers used in the analyses.

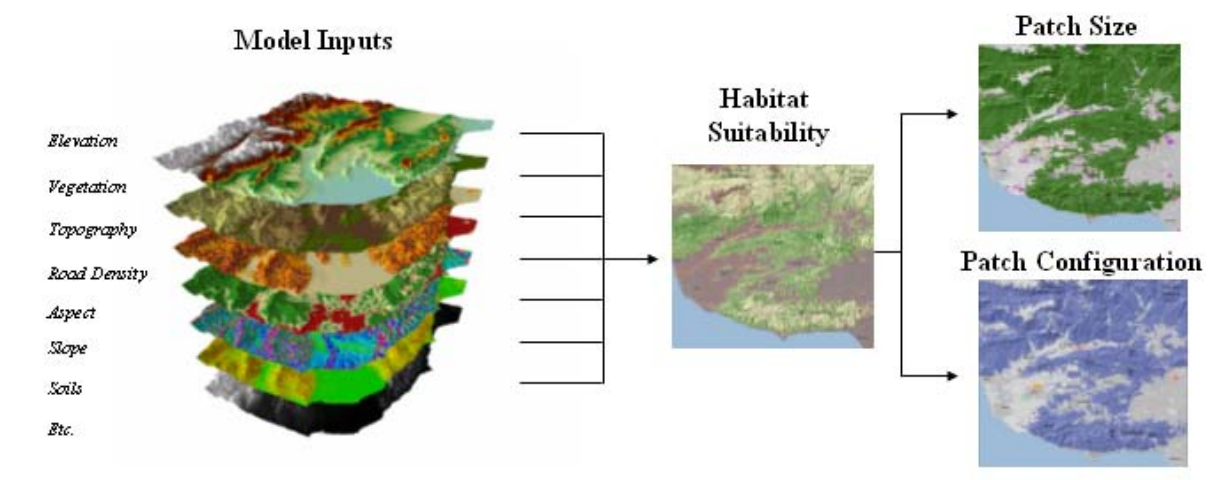
Patch Size & Configuration Analysis

Although the Least-Cost Union identifies the best zone available for movement based on the data layers used in the analyses, it does not address whether suitable habitat in the Union occurs in large enough patches to support viable populations and whether these patches are close enough together to allow for inter-patch dispersal. We therefore conducted patch size and configuration analyses for all focal species (Table 1) and adjusted the boundaries of the Least Cost Union where necessary to enhance the likelihood of movement. Patch size and configuration analyses are particularly important for species that require multiple generations to traverse the linkage. Many species exhibit metapopulation dynamics, whereby the long-term persistence of a local population requires connection to other populations (Hanski and Gilpin 1991). For relatively sedentary species like desert woodrat and terrestrial insects, gene flow will occur over decades through a metapopulation. Thus, the linkage must be able to accommodate metapopulation dynamics to support ecological and evolutionary processes in the long term.

A habitat suitability model formed the basis of the patch size and configuration analyses. Habitat suitability models were developed for each focal species using the literature and expert opinion. Spatial data layers used in the analysis varied by species and included: vegetation, elevation, topographic features, slope, aspect, hydrography, and soils. Using scoring and weighting

schemes similar to those described in the previous section, we generated a spectrum of suitability scores that were divided into five classes using natural breaks: low, low to medium, medium, medium to high, or high. Suitable habitat was identified as all land that scored medium, medium to high, or high.

To identify areas of suitable habitat that were large enough to provide a significant resource for individuals in the linkage, we conducted a patch size analysis. The size of all suitable habitat patches in the planning area were identified and marked as potential cores, patches, or less than a patch. *Potential core areas* were defined as the amount of contiguous suitable habitat necessary to sustain at least 50 individuals. A *patch* was defined as the area of contiguous suitable habitat needed to support at least one male and one female, but less than the potential core area. Potential cores are probably capable of supporting the species for several generations (although with erosion of genetic material if isolated). Patches can support at least one breeding pair of animals (perhaps more if home ranges overlap greatly) and are probably useful to the species if the patch can be linked via dispersal to other patches and core areas.



Model Inputs to Patch Size and Configuration Analyses vary by species. Patch size delineates cores, patches, and stepping-stones of potential habitat. Patch configuration evaluates whether suitable habitat patches and cores are within each species dispersal distance.

To determine whether the distribution of suitable habitat in the linkage supports meta-population processes and allows species to disperse among patches and core areas, we conducted a configuration analysis to identify which patches and core areas were functionally isolated by distances too great for the focal species to traverse. Because the majority of methods used to document dispersal distance underestimate the true value (LaHaye et al. 2001), we assumed each species could disperse twice as far as the longest documented dispersal distance. This assumption is conservative in the sense that it retains habitat patches as potentially important to dispersal for a species even if it may appear to be isolated based on known dispersal distances. Groupings of core areas and patches that were greater than the adopted dispersal distance from other suitable habitat were identified using a unique color.

For each species we compared the configuration and extent of potential cores and patches, relative to the species dispersal ability, to evaluate whether the Least Cost Union was likely to serve the species. If necessary, we added additional habitat to help ensure that the linkage provides sufficient live-in or “move-through” habitat for the species’ needs.

Minimum Linkage Width

While the size and distance among habitats (addressed by patch size and configuration analyses) must be adequate to support species movement, the shape of those habitats also plays a key role. In particular, constriction points—areas where habitats have been narrowed by surrounding development—can prevent organisms from moving through the Least Cost Union. To ensure that functional processes are protected, we imposed a minimum width of 2 km (1.2 mi) for all portions of the final Linkage Design.

For a variety of species, including those we did not formally model, a wide linkage helps ensure availability of appropriate habitat, host plants (e.g., for butterflies), pollinators, and areas with low predation risk. In addition, fires and floods are part of the natural disturbance regime and a wide linkage allows for a semblance of these natural disturbances to operate with minimal constraints from adjacent urban areas. A wide linkage should also enhance the ability of the biota to respond to climate change, and buffer against edge effects.

Field Investigations

We conducted field surveys to ground-truth habitat conditions, document existing barriers and potential passageways, and determine restoration opportunities. Because paved roads present the most formidable barriers, surveyors drove or walked each accessible section of road that transected a linkage. We identified areas where structures could be improved or installed, and opportunities to restore vegetation to improve road crossings and minimize roadkills.

Restoration and Conservation Opportunities and Recommendations

Each Linkage Design provides implementation opportunities for agencies, organizations, and individuals interested in participating in conservation activities in the linkage. Biological and land use summaries include descriptions and maps of vegetation, land cover, land use, roads, road crossings, railroads, and restoration opportunities. Each design also identifies existing planning efforts addressing the conservation and use of natural resources in the planning area. Finally, each provides a flyover animation using aerial imagery, satellite imagery, and digital elevations models, which provide a visualization of the linkage from a landscape perspective.

Appendix B
South Coast Wildland Network, Existing Conservation Investments

Linkage	Conservation Investments the Linkage Serves	Regional Significance	Major Conservation Investors
Tehachapi Connection	Links 4,100,994 acres of existing conservation investments. In the Sierra Nevada this includes Sequoia National Forest, 7 other Forests (Sierra, Inyo, Stanislaus, Eldorado, Tahoe, Plumas, Lassen), 3 National Parks (Sequoia-Kings Canyon, Yosemite, and Lassen), and Red Rock Canyon State Park. In the Sierra Madre, this includes Los Padres National Forest, Carrizo Plain National Monument, Bitter Creek National Wildlife Refuge, Hungry Valley State Vehicular Recreation Area, Wind Wolves Preserve, and others.	The only upland connection between the 2000 mile long Sierra-Cascade mountain system and the 800 mile long complex of the Coastal, Transverse, and Peninsular ranges of the S Coast region.	US Forest Service, Bureau of Land Management, US Fish & Wildlife Service, National Park Service, California State Parks, California Department of Fish and Game, The Wildlands Conservancy, The Nature Conservancy, among others.
Santa Monica-Sierra Madre Connection	Links 1,914,175 acres of existing conservation investments. In the Sierra Madre, this includes Los Padres National Forest, Carrizo Plain National Monument, Bitter Creek National Wildlife Refuge, Hungry Valley State Vehicular Recreation Area, and Wind Wolves Preserve. In the Santa Monica Mountains, this includes Santa Monica Mountains National Recreation Area, Point Mugu State Park, Malibu Creek State Park, Topanga State Park, and others.	The Sierra Madre – Sierra Madre Connection is one of the last remaining coastal to inland connections in the South Coast Ecoegion.	US Forest Service, National Park Service, California State Parks, Santa Monica Mtns Conservancy, Mountain Resources Conservation Authority, Conejo Open Space and Conservation Authority, Rancho Simi Dept of Parks and Rec, LA County Dept of Parks and Rec, The Nature Conservancy, among others.
Sierra Madre – Castaic Connection	Links 1,665,624 acres of existing conservation investments. In the Sierra Madre, this includes Los Padres National Forest, Carrizo Plain National Monument, Bitter Creek National Wildlife Refuge, Hungry Valley State Vehicular Recreation Area, and Wind Wolves Preserve. In the Castaic Ranges, this includes Angeles National Forest, Castaic Lake State Recreation Area, and others.	This linkage covers diverse ecological settings and encompasses several major vegetation types, including desert, forest, and coastal vegetation communities.	US Forest Service, US Fish & Wildlife Service, California State Parks, The Wildlands Conservancy, Ventura County Dept. of Parks & Recreation, and The Nature Conservancy, among others
San Gabriel-Castaic Connection	Links 661,023 acres of existing conservation investments. In the San Gabriel Mountains and Castaic Ranges, this includes Angeles National Forest, and Castaic Lake State Recreation Area, and others.	This linkage encompasses a unique transition zone between coastal and desert communities. The Santa Clara River, one of the last free-flowing rivers in southern California, is an integral part of the linkage.	US Forest Service, Bureau of Land Management, Santa Monica Mountains Conservancy, The Nature Conservancy, Rivers and Mountains Conservancy, Los Angeles County, City of Santa Clarita, among others.

San Gabriel – San Bernardino Connection	Links 948,451 acres of existing conservation investments. In the San Gabriel Mountains, this includes the Angeles National Forest. In the San Bernardino Mountains, this includes San Bernardino National Forest, Silverwood Lake State Recreation Area, Mission Creek Preserve, Pipes Canyon Preserve, Oak Glen Preserve and others.	The San Andreas Rift Zone runs through the linkage, producing steep rugged topography and a variety of microhabitats that support a rich diversity of natural communities.	US Forest Service, California State Parks, Bureau of Land Management, California Department of Fish and Game, The Wildlands Conservancy, among others.
San Bernardino – Granite Connection	Links 3,272,463 acres of existing conservation investments. In the San Bernardino Mountains, this includes San Bernardino National Forest, Silverwood Lake State Recreation Area, Mission Creek Preserve, Pipes Canyon Preserve, Oak Glen Preserve and others. In the Granite, Ord, and Rodman Mountains this includes land administered by the Bureau of Land Management, and others.	Ecoregional connection linking the South Coast Eocregion to the Mojave Ecoregion.	US Forest Service, Bureau of Land Management, California State Parks, California Department of Fish and Game, The Wildlands Conservancy, among others.
San Bernardino – Little San Bernardino	Links 3,236,289 acres of existing conservation investments. In the San Bernardino Mountains, this includes San Bernardino National Forest, Silverwood Lake State Recreation Area, Mission Creek Preserve, Pipes Canyon Preserve, Oak Glen Preserve and others. In the Little San Bernardino Mountains, this includes Joshua Tree National Park, and Big Morongo Canyon Preserve, and others.	Connects the South Coast Ecoregion to the Mojave and Sonoran Desert ecoregions, encompasses a unique variety of both coastal and desert habitats.	San Bernardino National Forest, Bureau of Land Management, The Wildlands Conservancy, Coachella Valley and Mountains Conservancy, among others.
San Bernardino – San Jacinto	Links 656,423 acres of existing conservation investments. In the San Bernardino Mountains, this includes San Bernardino National Forest, Silverwood Lake State Recreation Area, Mission Creek Preserve, Pipes Canyon Preserve, Oak Glen Preserve and others. In the San Jacinto Mountains, this includes San Bernardino National Forest, Mount San Jacinto State Park, and others.	San Bernardino Mountains are part of the Transverse Ranges and feature the highest peak in southern California, Mount San Gorgonio, while the San Jacinto Mountains are the highest and northernmost of the Peninsular Ranges.	US Forest Service, Bureau of Land Management, California State Parks, The Wildlands Conservancy, Coachella Valley Mountains Conservancy, Friends of the Desert Mountains, among others.
Palomar – San Jacinto – Santa Rosa Connection	Links 826,678.4 acres of existing conservation investments. In the San Jacinto Mountains, this includes San Bernardino National Forest, Mount San Jacinto State Park, and others. In the Palomar Mountains, this includes Cleveland National Forest and Palomar Mountain State Park, and others. In the Santa Rosa Mountains, this includes Anza Borrego Desert State Park, Santa Rosa and San Jacinto Mountains National Monument, and others.	Elements of both coastal and desert habitats occur side by side in many areas of this linkage, serving wildlife such as mountain lion, mule deer, Aguanga kangaroo rat, western toad, and the endangered quino checkerspot butterfly.	US Forest Service, Bureau of Land Management, California State Parks, County of San Diego, The Nature Conservancy, among others.

Santa Ana – Palomar Connection	Links 199,904 acres of existing conservation investments. In the Santa Ana Mountains, this includes Cleveland National Forest, Santa Margarita Ecological Reserve, Santa Rosa Ecological Plateau, Camp Pendleton, and others. In the Palomar Mountains, this includes Cleveland National Forest and Palomar Mountain State Park, and others.	The Santa Margarita River, the longest intact stream corridor in southern California, winds through the linkage.	US Forest Service, Bureau of Land Management, California State Parks, County of San Diego, San Diego State University Field Stations Program, The Nature Conservancy, among others.
Peninsular – Borrego Connection	Links 845,224 acres of existing conservation investments. In the Peninsular Ranges, this includes Cleveland National Forest, Cuyamaca Rancho State Park, and others. In the Santa Rosa Mountains, this includes Anza Borrego Desert State Park, Santa Rosa and San Jacinto Mountains National Monument, and others.	The linkage contains a number of rare and sensitive natural communities, including coastal sage scrub, grassland, meadow, palm oasis, coast live oak forest, and Engelmann oak woodland	US Forest Service, Bureau of Land Management, California State Parks, Anza Borrego Foundation and Institute, The Nature Conservancy, among others.
Otay Mountain—Cerro San Ysidro linkage	In the United States this includes, Otay Mountain Wilderness Area, administered by the BLM, Laguna Mountains of Cleveland National Forest, and others. In Baja California this includes Cerro San Ysidro.	Otay Mountain in southern California and Cerra San Ysidro in Baja represent sky islands of endemic plant species, and the last cross-border coastal sage scrub linkage.	US Forest Service, Bureau of Land Management, California State Parks, The Nature Conservancy, Conabio, Pronatura, and Universidad Autonoma de Baja California, among others.
La Posta linkage	This linkages serves to connect the Campo Valley in the United States with the El Hongo Valley in Baja California.	Occurs in an ecological transition zone between the coast and the desert and between mountain and inland valley biomes.	US Forest Service, Bureau of Land Management, California State Parks, The Nature Conservancy, Conabio, Pronatura, and Universidad Autonoma de Baja California, among others.
Parque-to-Park linkage	In the United States, this includes Anza Borrego Desert State Park, Santa Rosa and San Jacinto Mountains National Monument, and others. In the Sierra Juarez Mountains in Baja California, this includes Parque Constitucion de 1857.	Completing this connection will allow the endangered Peninsular bighorn sheep to repopulate the Sierra Juarez in northern Baja.	US Forest Service, Bureau of Land Management, California State Parks, The Nature Conservancy, Conabio, Pronatura, and Universidad Autonoma de Baja California, among others.

Appendix C
Literature Cited

Allan, J.D. 1995. Stream ecology: structure and function of running waters, Chapman and Hall, New York.

Allen, J.C. 2001. Summary of Ecological Findings for Malibu. California Coastal Commission.

Barnum, S.A. 2003. Identifying the best locations along highways to provide safe crossing opportunities for wildlife: a handbook for highway planners and designers. Colorado Department of Transportation.

Barton, D.R., W.D. Taylor, and R.M. Biette. 1985. Dimensions of riparian buffer strips required to maintain trout habitat in southern Ontario (Canada) streams. North American Journal of Fisheries Management 5:364-378.

Baxter, C. 2001. An integrated approach to bird conservation in the Mississippi Alluvial Valley. Keynote Address. Riparian Habitat and Floodplains Conference March 12-14, 2001, Sacramento, California.

Beier, P., K. L. Penrod, C. Luke, W. D. Spencer, and C. Cabañero. 2006. South Coast Missing Linkages: Restoring connectivity to wildlands in the largest metropolitan area in the United States. Chapter In K R. Crooks and MA Sanjayan, editors, Connectivity conservation: maintaining connections for nature. Cambridge University Press.

Beier, P. and R. Barrett. 1993. The cougar in the Santa Ana Mountain Range, California. Final Report for Orange County Cooperative Mountain Lion Study.

Beier, P., and S. Loe. 1992. A checklist for evaluating impacts to wildlife movement corridors. Wildlife Society Bulletin 20:434-440.

Borowske, J.R. and M.E. Heitlinger. 1981. Survey of native prairie on railroad rights-of-way in Minnesota. Transportation Research Records (Washington) 822:22-6.

Brosofske, K.D., J. Chen, R.J. Naiman, and J.R. Franklin. 1997. Harvesting effects on microclimatic gradients from small streams to uplands in western Washington. Ecological Applications 7:1188-1200.

Bureau of Land Management. 2005. Environmental Impact Report and Statement for the West Mojave Plan and California Desert Conservation Area Plan Amendment.

Bureau of Land Management. 2003. Draft Environmental Impact Report and Statement for the West Mojave Plan and California Desert Conservation Area Plan Amendment.

Cain, A.T., V.R. Tuovila, D.G. Hewitt, and M.E. Tewes. 2003. Effects of a highway and mitigation projects on bobcats in Southern Texas. Biological Conservation 114: 189-197.

California Department of Fish and Game. 2005. Rare Find California Natural Diversity Database.

Clevenger, A.P., and J. Wierzchowski. 2006. Maintaining and restoring connectivity in landscapes fragmented by roads. Chapter in K. R. Crooks and M. A. Sanjayan, editors. Connectivity conservation: maintaining connections for nature. Oxford University Press.

Clevenger, A.P., and N. Waltho. 2005. Performance indices to identify attributes of highway crossing structures facilitating movement of large mammals. Biological Conservation 121: 453-464.

Clevenger, A.P., B. Chruszcz, and K.E. Gunson. 2003. Spatial patterns and factors influencing small vertebrate fauna road-kill aggregations. Biological Conservation 109: 15-26.

Clevenger, A.P., B. Chruszcz, and K. Gunson. 2001. Drainage culverts as habitat linkages and factors affecting passage by mammals. Journal of Applied Ecology 38: 1340-1349.

Clevenger, A.P., and N. Waltho. 2000. Factors influencing the effectiveness of wildlife

underpasses in Banff National Park, Alberta, Canada. Conservation Biology 14: 47-56.

Coachella Valley Association of Governments(CVAG). 2004. Coachella Valley Multiple Species Habitat Conservation Plan and Natural Community Conservation Plan Public Review Draft October 15, 20004. Volume 1 The Plan. Prepared for Coachella Valley Association of Governments, prepared by Coachella Valley Mountains Conservancy.

County of Riverside. 2002. Western Riverside County Multiple Species Habitat Conservation Plan Draft EIR/EIS. Riverside County Integrated Project.

Craighead, A.C., E. Roberts, and F. L. Craighead. 2001. Bozeman Pass Wildlife Linkage and Highway Safety Study. Prepared for American Wildlands, http://www.wildlands.org/research.html.

Dodd, C.K, W.J. Barichivich, and L.L. Smith. 2004. Effectiveness of a barrier wall and culverts in reducing wildlife mortality on a heavily traveled highway in Florida. Biological Conservation 118: 619-631.

Edelman, P. 1991. Critical Wildlife Corridor/Haibtat Linkage Areas between the Santa Susana Mountains, the Simi Hills and the Santa Monica Mountains. Prepared for The Nature Conservancy.

Evink, G.L. 2002. Interaction between roadways and wildlife ecology. National Academy Press, Washington, D.C.

Fisher, R., and K. Crooks. 2001. Baseline biodiversity survey for the Tenaja Corridor and southern Santa Ana Mountains. U.S. Geological Survey Biological Resources Division and Department of Biology, San Diego State University, San Diego, California.

Forman, R.T.T., D. Sperling, J.A. Bissonette, A.P. Clevenger, C.D. Cutshall, V.H. Dale, L. Fahrig, R. France, C.R. Goldman, K. Heanue, J.A. Jones, F.J. Swanson, T. Turrentine, and T.C. Winter. 2003. Road Ecology: Science and Solutions. Island Press, Washington, D.C.

Forman, R.T.T. 1995. Land Mosaics: The Ecology of Landscapes and Regions. Cambridge University Press, Cambridge, England.

Gordon, K.M. et al. 2001. Motorist response to deer-sensing system in western Wyoming. In: The proceeding of the international conference of wildlife ecology and transportation. Keystone, Colorado.

Hanski, I., and M. Gilpin. 1991. Metapopulation Dynamics. Academic Press, London.

Huijser, M. P. and P. T. McGowen. 2003. Overview of animal detection and animal warning systems in North America and Europe. Pp. 368-382, in: The International Conference on Ecology and Transportation (ICOET); August 24-29, 2003; Lake Placid, NY.

Kohn, M.H., E.C. York, D.A. Kamradt, G. Haught, R.M. Sauvajot, and R.K. Wayne. 1999. Estimating population size by genotyping faeces. Proc. Royal Soc. (Series B) 266: 657-663.

Kreuper, D.J. 1992. Effects of land use on western riparian ecosystems. In: D.M. Finch and P.W. Stangel, eds. Status and Management of Migratory Birds. U.S.D.A. Forest Service General Technical Report RM-229.

LaHaye, W.S., R.J. Gutierrez, and J.R. Dunk. 2001. Natal dispersal of the spotted owl in southern California: dispersal profile of an insular population. Condor 103:691-700.

Little, S.J. 2003. The influence of predator-prey relationships on wildlife passage evaluation. ICOET 2003.

LSA Associates, Inc. 2004. Final Wildlife Corridor Assessment Ventura State Route 118. Prepared for CalTrans District 7 Division of Environmental Planning. Prepared by LSA Associates, Inc.

Marzluff, J.M., and K. Ewing. 2001. Restoration of fragmented landscapes for the conservation of birds: a general framework and specific recommendations for urbanizing landscapes. Restoration Ecology. 9:280-292.

Mata, C., I. Hervas, J. Herranz, F. Suarez, and J.E. Malo. 2005. Complementary use by vertebrates of crossing structures along a fences Spanish motorway. Biological Conservation 124: 397-405.

McDonald, W. and C.C. St Clair. 2004. Elements that promote highway crossing structure use by small mammals in Banff National Park. Journal of Applied Ecology 41:82-93.

Messmer, T.A., C.W. Hedricks, and P.W. Klimack. 2000. Modifying human behavior to reduce wildlife-vehicle collisions using temporary signing. In: Wildlife and highways: seeking solutions to an ecological and socio-economic dilemma. September 12-16: Nashville, TN.

Myers, S.J., S. Ogg, and L.F. LaPré. 1996. Potential wildlife corridors in the San Gorgonio Pass: Initial Report. Prepared for The Wildlands Conservancy; prepared by Tierra Madre Consultants, Inc.

Ng, S.J., J.W. Dole, R.M. Sauvajot, S.P.D. Riley, and T.J. Valone. 2004. Use of highway undercrossings by wildlife in southern California. Biological Conservation 115, pp. 499-507.

Ng, S.J. 2000. Wildlife use of underpasses and culverts crossing beneath highways in southern California. MS Thesis, California State University Northridge, Northridge, CA. 58pp.

Psomas. 2002. Regional wildlife corridors, wildlife utilization, and open space in the Simi Valley region, Ventura and Los Angeles Counties, California, revised draft, June 17. Prepared for Unocal Land and Development Company by Psomas Natural Resources Group. Costa Mesa, California. June 17.

Reed, D.M. and J.A. Schwarzmeier. 1978. The prairie corridor concept: possibilities for planning large scale preservation and restoration. In Lewin and Landers (eds) Proceedings of the Fifth Midwest Prairie Conference, pp. 158-65. Iowa State University, Ames, Iowa, USA.

Reed, D.F. 1981. Effectiveness of highway lighting in reducing deer-vehicle accidents. Journal of Wildlife Management. 45:1981.

Riley, S.P.D., J.P. Pollinger, R.M. Sauvajot, E.C. York, C. Bromley, T.K. Fuller, and R.K. Wayne. 2006a. A southern California freeway is a physical and social barrier to gene flow in carnivores. Molecular Ecology 15: 1733-1741.

Riley, S.P.D., R.M. Sauvajot, T.K. Fuller, E.C. York, D.A. Kamradt, C. Bromley, and R.K. Wayne. 2003. Effects of urbanization and habitat fragmentation on Bobcats and coyotes in southern California. Conservation Biology 17:566-576.

Robinson, M., P. McGowen, A. Habets, and C. Strong. 2002. Safety Applications of ITS in Rural Areas. Section 7.1.1. Science Applications International Corporation, McLean, VA, USA.

Ruediger, B. 2001. High, wide, and handsome: designing more effective wildlife and fish crossings for roads and highways. ICOET 2001.

Sauvajot, R.M., E.C. York, T.K. Fuller, H.S. Kim, D.A. Kamradt, and R.K. Wayne. 2000. Distribution and status of carnivores in the Santa Monica Mountains, California: preliminary results from radio telemetry and remote survey camerias. In: Keeley, J.E., M.B. Baer-Keeley, and C.J. Fotheringham (Eds.), Second interface between Ecology and Land Development in California. US Geological Survey, Sacramento, CA. pp. 113-123.

Singleton, P.H., W.L. Gaines, and J.F. Lehmkuhl. 2002. Landscape Permeability for Large Carnivores in Washington: A Geographic Information System weighted-distance and least-cost corridor assessment. USDA Forest Service, Pacific Northwest Research Station, Research Paper PNW-RP-549.

Soulé, M.E. 1989. USDI-National Park Service Proposed Land Exchange: Wildlife Corridors. Unofficially released report prepared for the Santa Monica Mountains National Recreation Area.

Sweanor, L., Logan, K., Bauer, J., and W. Boyce. 2003. Southern California Puma Project June 2003 Progress Report for Interagency Agreement No. C0043040 (California State Parks and the University of California, Davis)

USDA Forest Service. 2004. Draft Environmental Impact Statement for Revised Land Managmenet Plans: Angeles National Forest, Cleveland National Forest, Los Padres National Forest, and San Bernardino National Forest. Pacific Southwest Region, R5-MB-045, May 2004.

Walker, R. and L. Craighead. 1997. Analyzing Wildlife Movement Corridors in Montana Using GIS. ESRI User Conference Proceedings.

White, M.D., J.A. Stallcup, W.D. Spencer, J.R. Strittholt, and G.E. Heilman. 2003. Conservation significance of Tejon Ranch: a biogeographic crossroads. Unpublished report prepared prepared by the Conservation Biology Institute for Environment Now. August. http://www.consbio.org/cbi/pubs/index.htm

Wilson, J.D. and M.E. Dorcas. 2003. Effects of habitat disturbance on stream salamanders: Implications for buffer zones and watershed management. Conservation Biology 17: 763-771.

Yanes, M., J.M. Velasco, and F. Suárez. 1995. Permeability of roads and railways to vertebrates: the importance of culverts. Biological Conservation 71: 217-222.

Preferred Citation: South Coast Wildlands. 2008. South Coast Missing Linkages: A Wildland Network for the South Coast Ecoregion. Produced in cooperation with partners in the South Coast Missing Linkages Initiative. Available online at http://www.scwildlands.org.

Appendix H7
Existing SEA Descriptions

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DEIR Appendix H7- Existing SEA Descriptions

Malibu Coastline (SEA 1)

Criteria 2, 3, 4, 5, 6, 7
Santa Monica Mountains Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Triunfo Pass, Point Dume, Malibu Beach, and Topanga. This area is a relatively undisturbed coastal region where upwelling of nutrient-rich waters and a variety of habitats support highly productive and extremely diverse marine communities. The area possesses some of the best kelp bed habitat south of Santa Barbara, and supports the only remaining natural kelp beds off the mainland coast of Los Angeles County. This kind of area may be one hundred times more productive than adjacent sand bottom communities, and provides refuge, food, and nursery grounds for thousands of species.

Rocky outcrops alternate with sandy stretches along this coastline, and outcrops are found to a depth of 600 feet. The stability of the substrate and the variety of exposures provide microhabitats for a great number of organisms. Characteristically, rocky shorelines from the lower intertidal zone to about 100 foot depth can be the most biologically active areas in the world. Point Dume is the only place rocky intertidal habitat occurs between Palos Verdes Peninsula and well into Ventura County.

This coastline also possesses the only complete, undisturbed sandy beaches remaining in Los Angeles County. Although very dynamic in physical stability and therefore unfavorable for the development of a diverse biological community, these areas do offer habitat for a number of organisms. An important micro-community of decomposers is present. Sandy beaches provide feeding areas for many bird species. In addition, the soft substrate offers a repository for eggs and nursery grounds for many species.

Point Dume (SEA 2)

Criteria 3, 4, 5, 7
Santa Monica Mountains Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Point Dume. Point Dume is one of two remaining areas in Los Angeles County where a diverse and healthy mixture of terrestrial and marine habitats can be found in close association. Marine habitats consist of an unprotected rocky shore with outlying reefs, rocks, kelp beds, sandy beach pockets, and numerous small caves. Due to strong upwellings along the coast bringing in nutrient-rich waters, they possess highly diverse and productive marine communities. This relative healthiness is also due to limited public access, which has protected the fragile marine ecosystems.

Coastal strand vegetation is found on sandy beaches below bluffs rising 100 to 200 feet above the coast. *Coreopsis gigantea* and *Dudleya caespitosa* are found in these communities at the southern limit of their range. Several small drainages cut through the bluffs and extending up to a mile inland. The slopes are covered by Venturan coastal sage scrub. The value of these communities is increased by the unique geographic position of Point Dume. This headland extends into Santa Monica Bay more than a mile beyond the rest of the Malibu coast, and it is located within the Pacific Flyway. As result, the area is an important resting and jumping-off point for migratory birds. Without the remaining terrestrial habitats, this refuge would be lost.

Zuma Canyon (SEA 3)

Criteria 3, 4, 7
Santa Monica Mountains Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Point Dume. Zuma Canyon is one of the last major drainages in the Santa Monica Mountains having a year-round stream, and remaining in an undeveloped, non-road condition. The upper ridges are dry and support coastal sage scrub. This blends into chaparral on the lower, steeper, shaded slopes. The canyon bottom has a rich riparian community that is more extensive and in better condition than neighboring canyons. This is due in part to the difficulty of public access, but primarily to the presence of a perennial stream. The stream supports abundant wildlife populations, including amphibians and birds that are dependent on surface moisture, a very limited resource in all of southern California. Deer and other large mammals utilize this as a water source, and mountain lions have been sighted in the canyon. The officially endangered plant *Pentachaeta lyonii* occurs in the area.

Upper La Sierra Canyon (SEA 4)

Criteria 1, 2, 3, 5, 7
Santa Monica Mountains Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Point Dume. Upper La Sierra Canyon contains an unusually rich and diverse stand of canyon flora including the Santa Monica Mountain Live-forever (*Dudleya cymosa* ssp. *marcescens*), an officially endangered plant species. The Creek Dogwood (*Cornus glabrata*), found at only one other site within the County, is abundant. The Giant Chain Fern (*Woodwardia fimbriata*), which normally reaches heights of 5½ to 6½ feet, grows eight to nine feet tall at this locality. This species is found at only four other localities in the Santa Monica Mountains, but nowhere else is it as easily accessible as in this canyon. The Humboldt Lily (*Lilium humboldtii*) also reaches heights of nine feet at this location. Accompanying this unusual stand of canyon vegetation is a healthy woodland community. Big-leaf Maple (*Acer macrophyllum*) reaches heights of 60 feet, and is surrounded by dense stands of Coast Live Oak (*Quercus agrifolia*) and California-laurel (*Umbellularia californica*). This dense aggregation of uncommon species makes the area genuinely unique.

Malibu Canyon and Lagoon (SEA 5)

Criteria 2, 3, 4, 5, 6, 7
Santa Monica Mountains Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Malibu Beach. This area contains the only lagoon in Los Angeles County, and it is the only one between Point Mugu in Ventura County and Anaheim Bay in Orange County. The presence of a perennial stream, and its sharp relief between the interior valleys and the coast are unique to the Santa Monicas and allow for the most unique and diverse biota in the region.

The lagoon is brackish and supports two major plant communities, coastal salt marsh and coastal strand. The lagoon area is an important bird refuge where seasonal migrants can rest and feed. Over 200 species of birds have been observed here. The salt marsh vegetation is dominated by two species of pickleweed, *Salicornia virginica* and *S. subterminalis* which serve as valuable non-breeding habitat for Belding's savannah sparrow *(Passerculus sandwichensis beldingi)*. This species is classified as endangered by the California Department of Fish and Game.

The perennial stream and its sharp relief between the interior valleys and the coast are unique to the Santa Monicas, and allow for the most unique and diverse biota in the region. The perennial stream in Malibu Canyon supports outstanding oak and riparian woodlands with an unusual variety of tree species. Black cottonwood (*Populus trichocarpa*) and Leatherleaf ash (*Fraxinus velutina* var. *coriacea*) are found here. Neither species is common in this region. There is also an abundance of woodland shrubs, native wildflowers, and other herbaceous growth.

Malibu Canyon bisects the Santa Monica Mountain range. As a result, species normally restricted to the drier interior valleys extend their range down the canyon and grow in association with coastal forms. This has created a very unique flora in the canyon. Despite declining wildlife populations over much of the Santa Monica Mountain region, Malibu Canyon continues to support many unique and uncommon wildlife species including mountain lions and golden eagles. The rich riparian vegetation offers an excellent resting and feeding area for birds migrating along the coast. In addition, Malibu Creek is the one of the few watercourses in southern California where steelhead continue to run and spawn.

Las Virgenes (SEA 6)

Criteria 5, 7
Santa Monica Mountains Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Thousand Oaks and Calabasas. This area contains a number of plants common in the interior areas of southern California, but found nowhere else in the Santa Monica Mountains region. The most conspicuous of these is *Juniperus californica*, the California Juniper. Also common on the hillside is *Haplopappus linearifolius*, a characteristic shrub of interior hillside and desert ranges. *Calochortus venustus*, a species of the interior coast ranges of central California, is at its southern distribution limit in the Santa Monica Mountains and is

found only at two other localities in the range. In addition, this is the only locality in the Santa Monica Mountains where *Dudleya cymosa* grows in full sun. All other populations of the species grow on steep, north-facing rocky cliffs. The surrounding vegetation of the area consists of coastal sage scrub and chaparral.

Hepatic Gulch (SEA 7)

Criteria 3, 5, 7
Santa Monica Mountains Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Malibu Beach. This area possesses a vegetative association with many uncommon species and unique ecological relationships. Constant micro-slumping of the developing soil creates a variety of micro-habitats in close proximity to one another. As a result, moisture dependent ferns and mosses grow next to xerophytic *Yucca* and *Dudleya* species. In addition, there is an amazing variety of uncommon and fragile liverworts and hornworts.

Malibu Creek State Park Buffer Area (SEA 8)

Criteria 8
Santa Monica Mountains Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Malibu Beach and Point Dume. These buffer areas contain watershed critical to the preservation of important biological resources within Malibu Creek State Park. The park possesses several areas, including Fern Canyon, Mendenhall Canyon, and Lost Canyon, with a rare and fragile flora. These buffers are portions of watersheds which lie outside the park. Their preservation is necessary to maintain the fragile canyon environments.

Cold Creek (SEA 9)

Criteria 3, 5, 7
Santa Monica Mountains Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Malibu Beach. This is a relatively undisturbed natural sandstone basin. The floor of the valley is steep, with springs and a perennial stream, Cold Creek. The year-round surface water, which is uncommon in southern California, supports an unusually diverse flora. The extreme range in physical conditions, from wet streambed to dry rocky ridges, makes the area a show-place for native vegetation. Pristine stands of chaparral, southern oak woodland, coastal sage scrub, and riparian woodland are all found in the area. Several plant species which are uncommon in the general region are found here. Those include stream orchid (*Epipactis gigantea*), red mimulus (*Mimulus cardinalis*), Humboldt lily (*Lilium humboldtii* var. *ocellatum*), big-leaf maple (*Acer macrophyllum*), and red shank (*Adenostoma sparsifolium*). In addition, the presence of several tree-sized flowering ash (*Fraxinus dipetala*), reaching 40 feet in height, is a unique botanical oddity. This shrub species has a normal maximum height of 15 to 20 feet.

Due to its many outstanding botanical features, the area serves an integral role as part of the instructional program for many academic institutions as well as a site for nature study and scientific research.

Tuna Canyon (SEA 10)

Criteria 3, 4, 7
Santa Monica Mountains Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Topanga. Tuna and Pena Canyons are the last drainages in the central and eastern Santa Monica Mountains that have not sustained development either in the watershed, or between the canyon mouth and the coast. A year-round stream is present in Tuna Canyon. This resource in itself is limited in distribution in the Santa Monica Mountains, and most of southern California. Due to this feature and its coastal exposure, the riparian woodland in the canyon bottom is in excellent health, and supports healthy wildlife populations. Animals utilize the stream as a water source, and forage in the chaparral and coastal sage scrub on adjacent hillsides.

The combined qualities of healthy vegetation, riparian woodland,, surface moisture, no development, and an unobstructed opening to the coast are unique in the western Santa Monica Mountains and have caused the canyons to become an important area to migratory bird species. In addition to migratory songbirds, waterfowl have been seen in the canyon during migration.

Temescal-Rustic-Sullivan Canyons (SEA 11)

Criteria 7
San Fernando Valley Planning Area, Westside Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Topanga and Canoga Park. These canyons are representative samples of the dry chaparral and coastal sage scrub plant communities found in the interior canyons of the Santa Monica Mountains. The riparian communities in the canyon bottoms are more open, and do not support a dense understory growth. Wildlife in these canyons is typical of that found in the communities throughout the coastal ranges of southern California. Deer, coyote, mountain lion, hawks, eagles, and owls are the larger species that comprise this type of fauna.

These canyons were chosen for Priority Group 7 because they are contiguous, self-contained watersheds that are large enough in size to support representative samples of native flora and fauna. They are relatively undisturbed, and are the last major pieces of habitat in the Santa Monica Mountains before reaching the dense urban development to the east. This area would serve as a corridor for any gene flow and species movement that may take place between the Santa Monica and San Gabriel Mountains via the Hollywood Hills, Griffith Park and the Verdugo Mountains.

Palo Comado Canyon (SEA 12)

Criteria 3, 7
Santa Monica Mountains Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Calabasas. This area is one of the last examples of any significant size of southern oak woodland/savannah in Los Angeles County. There are other localities in the area that support southern oak woodland on steep hillsides. However, the savannah type community found in the Palo Comado Canyon area is on gently rolling hills having an open grassy understory. This habitat was once widely distributed, but it has been impacted by extensive utilization for agriculture and urban development. The few remaining areas have also been heavily impacted by cattle grazing. Most native grasses and forbs of the understory have been replaced by Eurasian species. In many cases, cattle have consumed oak seedlings and have are prevented recruitment of new trees to replace older individuals as they die. Nevertheless, the trees support an abundant population of raptorial birds and woodpeckers. Large mammals and quail often utilize the watering troughs and saltlicks provided for cattle. The western gray squirrel is also found in these trees. The understory vegetation is utilized by grassland bird species, especially by migratory and wintering populations.

Chatsworth Reservoir (SEA 13)

Criteria 2, 3, 7
San Fernando Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Calabasas and Canoga Park. The concentration of a variety of habitats, and the presence of a large body of freshwater closed to the public, offer important wintering and breeding ground for many songbirds and waterfowl. These features are rapidly disappearing in Los Angeles County and are critical to the remaining diversity of wildlife resources.
The habitat types found include freshwater marsh. This habitat is very scarce in Los Angeles County and is the habitat of many uncommon bird species. This undisturbed body of freshwater adjacent to grasslands and oak savannah offers prime wintering habitat to geese, an uncommon wildlife resource over much of southern California.

The presence of several protected avian communities makes the area valuable for bird study by students, researchers, and naturalists.

Simi Hills (SEA 14)

Criteria 7
San Fernando Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Calabasas. This area contains relatively undisturbed representative examples of most of the biotic communities found in the Simi Hills. Habitats include chaparral, coastal sage scrub, southern oak woodland and riparian woodland. While all of these are relatively common in Los Angeles County, this is one of two areas that include these cismontane associations at the western edge of the County.

The area also serves as a buffer and wildlife corridor for movement between the Chatsworth reservoir and the undeveloped portions of the Simi Hills in Ventura County. Genetic exchange and replenishment of native populations in the Chatsworth Reservoir area are important considerations here.

Tonner Canyon/Chino Hills (SEA 15)

Criteria 7
East San Gabriel Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Yorba Linda and La Habra. Tonner Canyon is one of three areas in the hilly region of eastern Los Angeles County that still supports a relatively undisturbed stand of southern oak woodland, chaparral, coastal sage scrub, and riparian woodland complex that was once common there. The remainder of this vegetation type has been converted to agricultural and urban uses. This is true throughout the entire southern California region, making it one of the most rapidly disappearing habitat types. These three areas were chosen to serve as representative samples of these once widespread vegetative associations.

The vegetation in Tonner Canyon is in good condition, and supports heavily forested areas of California walnut (*Juglans californica*). This species is uncommon outside Los Angeles and Ventura Counties, and it has one of its major populations in this portion of Los Angeles County. Tonner Canyon is of sufficient size and is in close enough proximity to the other recommended areas in this region, that it should be able to continue to support relatively healthy animal populations if preserved. This probability is increased by the presence of a riparian woodland and an intermittent stream in the canyon bottom.

Buzzard Peak/San Jose Hills (SEA 16)

Criteria 7
East San Gabriel Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: San Dimas. Buzzard Peak is one of three areas in the hilly region of eastern Los Angeles County that still supports a relatively undisturbed stand of southern oak woodland, chaparral, coastal sage scrub, and riparian woodland complex that were once common in the region. The remainders of these vegetation types have been converted to agricultural and urban uses. This is true throughout the entire southern California region, making them some of the most rapidly disappearing habitat types. These three areas were chosen to serve as representative samples of these once widespread vegetative associations.

The vegetation and wildlife on Buzzard Peak are in relatively, good condition. This is partly as a result of the buffer provided by California State Polytechnic University at Pomona, Mt. San Antonio Junior College, and Forest Lawn Memorial Park. It is also a result of the area being a peak, thus isolating it from disturbances that could arise from an upstream or up-slope source. The area adjacent to Cal Poly supports dense groves of California walnut (*Juglans californica*), which comprise the sensitive walnut woodland habitat. This species is uncommon outside Los Angeles and Ventura Counties, and has one of its major populations in this hilly region. Buzzard Peak is of sufficient size and in close enough proximity to the

other recommended areas in this region, that is should be able to continue to support relatively healthy animal populations if preserved.

Powder Canyon/Puente Hills (SEA 17)

Criteria 7
East San Gabriel Valley Planning Area, Gateway Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: La Habra. Powder Canyon is one of three areas in the hilly region of eastern Los Angeles County that still supports a relatively undisturbed stand of the southern oak woodland, coastal sage scrub, and riparian woodland complex that was once common there. The remainder of this vegetation has been converted to agricultural and urban uses. This is true throughout the entire southern California region, making it one of the most rapidly disappearing habitat types. These three areas were chosen to save as representative samples of these once widespread vegetative associations.

Powder Canyon is the only recommended area that contains an undisturbed portion of self-contained watershed. As a result of this, the vegetation is in good condition. Preservation of this type of area will eliminate the potential of disturbance from upstream sources. If preserved, Powder Canyon is of sufficient size and in close enough proximity to the other recommended areas in the region that it should be able to continue to support relatively healthy animal populations. The diversity of wildlife is greatly enhanced by the presence of riparian woodland habitat in the canyon bottom.

Way Hill (SEA 18)

Criteria 1, 2, 3, 4, 5, 7
East San Gabriel Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: San Dimas. Way Hill supports a population of *Dudleya multicaulis*, the many-stemmed dudleya. This plant species is recognized as endangered by the U.S. Fish and Wildlife Service, and as such is protected by federal law. It is restricted to dry stony places below 2000 feet in the coastal sage scrub and chaparral communities of Los Angeles, San Bernardino, Riverside, Orange, and San Diego Counties.

San Francisquito Canyon (SEA 19)

Criteria 1, 2, 3, 4, 5, 6, 7
Santa Clarita Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Newhall, Warm Springs Mountain, Green Valley, Sleepy Valley; Lake Hughes and Del Sur. San Francisquito Canyon possesses two populations of the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*). This species was formerly found in the Los Angeles, San Gabriel, and Santa Ana Rivers, but is now restricted to the Santa Clara River and San Francisquito Canyon. For this reason, the stickleback has been placed on both the state and federal endangered species lists. In San Francisquito Canyon, it is confined to

permanent streams and pools below Drinkwater Reservoir, and above Baird Canyon. The lower population is dependent on legally mandated water release from Drinkwater Reservoir.

The watershed that supplies San Francisquito Canyon is relatively undisturbed. The hillsides support a dense cover of coastal sage scrub and chaparral. The San Francisquito streamcourse is mostly natural and it maintains a good riparian woodland community. The health of this drainage is evident by the fact that, in addition to supporting the unarmored threespine stickleback, the creek has been classified as an active trout fishing stream by the National Forest Service and the California Department of Fish and Game.

The primary concern for the survival of the unarmored threespine stickleback is the maintenance its habitat. The fish requires clean, free-flowing perennial streams and ponds surrounded by natural vegetation. Intermittent areas where surface water connects perennial streams are also important during the wet season. The natural vegetation along the intermittent portion of the stream slows heavy runoff during the rainy season, decreases destruction and siltation of habitat in downstream areas, and provides habitat for migration between populations.

The unarmored threespine stickleback populations in San Francisquito Canyon are the only ones for which the possibility exists to plan and control development in the majority of the watershed . This is certainly not true for populations in the Santa Clara River valley.

Santa Susana Mountains (SEA 20)

Criteria 2, 3, 5, 7
San Fernando Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Santa Susana, Val Verde and Oat Mountain. The Santa Susana Mountains are one of several relatively small ridges that form the Transverse Ranges and blend eastward into the larger San Gabriel and San Bernardino Mountains. The Santa Monica Mountains are also part of this system and form a coastal barrier shielding the interior ridges from the direct influences of moist marine air, making these interior ridges drier than the coastal ones. The vegetation of the Santa Susana Mountains consists of coastal sage scrub on south-facing slopes, dense chaparral on north-facing slopes, and oak, walnut and riparian woodlands in valleys. The oak woodland communities are extremely diverse, supporting six species of oaks. These include coast live oak (*Quercus agrifolia*), valley oak (*Q. lobata*), canyon live oak (*Q. chrysolepis*), scrub oak (*Q. berberidifolia*), interior live oak (*Q. wislizenii*), and a single known location of Palmer's oak (*Q. palmeri*). The latter species is known in Los Angeles County only from this area. The walnut woodlands are frequently found in canyons of intermittent streams and consist primarily of California black walnut (*Juglans californica*), flowering ash (*Fraxinus dipetala*), Mexican elderberry (*Sambucus mexicana*), and coast live oak. Fires appear to promote the expansion of walnut woodlands. Unusual California walnut-flowering ash woodlands occur at mid-elevations within canyons of the north slopes. This community appears to be unique to the Santa Susana Mountains. The bigcone spruce (*Pseudotsuga macrocarpa*)-canyon live oak forest at higher elevations represents one of the northwesternmost examples of this community.

The Santa Susana Mountains are the main representative of these low, dry interior mountain ranges in Los Angeles County. The core of this range is in good condition and has not been heavily disturbed by human use. These mountains are becoming isolated from surrounding natural areas As by continued urban expansion in the San Fernando, Simi, and Santa Clarita Valleys. The Santa Susana Mountains have become an important wildlife corridor for gene flow and species movement between the San Gabriel and Santa Monica Mountains via the Simi Hills.

Santa Susana Pass (SEA 21)

Criteria 1, 2, 3, 4, 5, 7
San Fernando Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Santa Susana and Oat Mountain. *Hemizonia minthornii*, the Santa Susana tarweed, is known primarily from the Santa Susana Pass. For this reason, it has been placed on the Federal endangered species list. Six populations have been recorded on these rocky chaparral covered hillsides, four of which are in Los Angeles County.

In addition to supporting this endangered species, the Santa Susana Pass is an important wildlife migration route. As urbanization continues in the San Fernando and Simi Valleys, the Simi Hills and Santa Susana Mountains are becoming isolated from each other. The Pass, however, remains in a relatively natural condition and serves as a corridor for gene flow and species movement.

Santa Fe Dam Floodplain (SEA 22)

Criteria 3, 5, 7
East San Gabriel Valley Planning Area, West San Gabriel Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles:Azusa and Baldwin Park. The floodplain behind Santa Fe Dam supports one of the last examples of a vegetative type that was once commonly found on the numerous river outwashes of the Los Angeles Basin. The arroyo community found here is composed of scattered shrubs that have become adapted to the rugged shifting substrate. The community has suffered heavy losses through flood control projects and urbanization, making this area increasingly important as a specimen of a once common community. Due to its geographical situation, the value of this area is even greater than might otherwise be expected. It has an undeveloped, unobstructed corridor of natural vegetation connecting it to the San Gabriel Mountains. This allows wildlife to migrate between the areas. As a result, wildlife communities are in good condition, and represent a full complement of species characteristic of this community type. This includes golden eagle and white--tailed kite, both of which are fully protected by the California Department of Fish and Game. Many of these species are becoming increasingly difficult to find near the Los Angeles metropolitan area.

Santa Clara River (SEA 23)

Criteria 1, 2, 3, 4, 5, 7
Antelope Valley Planning Area, Santa Clarita Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Val Verde, Newhall, Acton, Agua Dulce, and Mint Canyon. Soledad Canyon and the Santa Clara River possess several populations of the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*). This species was formerly found in the Los Angeles, San Gabriel, and Santa Ana Rivers, but is now restricted to the Santa Clara River and San Francisquito Canyon. For these reasons and due to threats to its habitat, the fish species has been placed on the state and federal endangered species lists. In the Santa Clara River, the unarmored threespine stickleback is limited to permanent streams and pools from the mouth of San Francisquito Canyon west to the Ventura-Los Angeles County line, and from near Lang Station east to Arrastre Canyon.

The reason the unarmored threespine stickleback has been able to survive in the Santa Clara River is that its remaining habitat has been relatively undisturbed. The Santa Clara River is unique in being the only major river draining the San Gabriel Mountains that has not been channelized. The vegetation consists of fresh water marsh, coastal sage scrub, oak woodland, and riparian woodland communities. The broad wash association is unlike that found in steeper mountain canyons, and is exceedingly scarce in the Los Angeles basin. The trees serve as habitat for many raptorial bird species. The red-shouldered hawk is restricted to woodland communities, and the species is becoming increasingly uncommon in southern California due to habitat destruction. The National Audubon Society and others have expressed concern for hawk's welfare.

The primary concern for the survival of the unarmored threespine stickleback is the loss of suitable habitat. The species requires clean, free-flowing, perennial streams and ponds surrounded by native vegetation. Intermittent areas connecting perennial streams are also important during the wet season when surface water is present. The natural vegetation and stream course slow heavy runoff during the rainy season, decrease destruction and siltation of habitat in downstream areas, and provide habitat for stickleback migration between populations.

Tujunga Valley/Hansen Dam (SEA 24)

Criteria 1, 3, 5, 7
San Fernando Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Van Nuys, San Fernando, and Sunland. The Tujunga Canyon/Hansen Dam area possesses several important features. The floodplain behind the dam supports one of the last examples of open coastal sage scrub vegetation that was once found in the numerous arroyos of the Los Angeles basin. Portions of the river bottom have surface moisture, and support small pockets of fresh water marsh, another limited resource in Los Angeles County. The remainder of the arroyo and surrounding hillsides are dry, and support several species of plants that are otherwise found only on the desert slopes of the San Gabriel Mountains. Populations of Nevin's barberry (*Berberis nevinii*) and slender-horned spineflower (*Dodecahema* (*Chorizanthe*) *leptoceras*) have been found in the wash. Both species are extremely limited in distribution and have been placed on the federal rare and endangered species list.

The area southwest of the dam is used as a spreading ground. This has created several fresh water marsh areas that are used by marsh birds, migratory waterfowl, and shore birds. The area is also valuable as a

wildlife corridor. The vegetation in the Tujunga Valley runs nearly uninterrupted from the foot of the Verdugo Mountains well up into the San Gabriel Mountains.

San Dimas Canyon (SEA 25)

Criteria 3, 4, 5, 7
Antelope Valley Planning Area, East San Gabriel Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Glendora. The wash at the mouth of San Dimas Canyon supports a good example of a lowland riparian community. This type of vegetation was once found along the smaller streams draining the San Gabriel Mountains and crossing the Los Angeles basin. Most of the remaining riparian communities in Los Angeles County are of the type found in the canyons of the San Gabriel Mountains, and surrounding hilly regions. The San Dimas wash is one of the last remaining areas that support the more open flatland riparian woodland habitat.

Riparian communities are extremely valuable wildlife habitats. Many birds require the trees or shrubs as nesting and perching sites. Large mammals use it as a migration corridor, and rest area, often using the shade to escape the sun. The habitat is moist and supports a large number of amphibians and invertebrate species. These species add greatly to the diversity and productivity of an area, but would not be able to survive there without the riparian community.

San Antonio Canyon Mouth (SEA 26)

Criteria 3, 5, 7
East San Gabriel Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Mt. Baldy and Ontario. The vegetation found at the mouth of San Antonio Canyon is the best example of arroyo or wash vegetation remaining in Los Angeles County. This area lies downstream from San Antonio Dam and has not been disturbed by flood control measures, as have similar areas behind Hansen and Santa Fe Dams. The area is also different from the other two in that it is not confined to an arroyo or a wash, but is also found on the adjacent alluvial fan. This is the last area in Los Angeles County where this community has not been channelized and the surrounding fan developed.

The vegetation is a dry form of coastal sage scrub that has become adapted to a coarse substrate that often shifts during times of peak run off. Many of the plants found here are desert forms that otherwise do not occur in the Los Angeles Basin. The vegetation is much denser and more stable on this alluvial fan and is a distinct situation from that found in the arroyos behind Santa Fe and Hansen Dams.

Portuguese Bend Landslide (SEA 27)

Criteria 3, 4, 5, 7
South Bay Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Redondo Beach, San Pedro and Torrance. The Portuguese Bend Landslide is the largest area of natural vegetation remaining on the Palos

Verdes Peninsula. The geographical location and geological history of the peninsula make remaining habitat extremely valuable for ecological and scientific reasons. The peninsula, which was an island in recent geological time, has close floral and faunal similarities to the Channel Islands. This feature makes the Portuguese Bend Landslide area a natural research laboratory for the study of island biogeography and evolutionary ecology.

The vegetation found in the area is coastal sage scrub. This plant community supports a surprising number and variety of species. There are at least three races of birds resident on the peninsula that are found nowhere else except the Channel Islands. These are the insular forms of the orange--crowned warbler, western flycatcher, and Allen's hummingbird. the same phenomena has been documented for plant species. A species of live-forever, *Dudleya virens*, which is endemic to the Channel Islands and the Palos Verdes Peninsula, is found near Point Vicente.

The area also serves as habitat to many migrating birds moving through the region in fall and spring. The Peninsula is a headland that juts into the Pacific several miles further than the surrounding coastline. Migrating terrestrial and shore birds flying over the open ocean on their north--south migration along the Pacific Flyway, spot this headland and stop to rest and feed. Many of these birds will stay and spend the winter in the area. Thus, the geographic position makes this habitat much more important than might otherwise be expected.

El Segundo Dunes (SEA 28)

Criteria 1, 2, 3, 4, 5, 7
Westside Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Venice. The El Segundo Dunes, located at the west end of the Los Angeles International Airport, are the last remnants of a coastal dune system that once stretched several miles further, north and south. The vegetation found here does not occur anywhere else in the County, and is uncommon throughout southern California. The vegetation is southern dune scrub which is adapted to sandy, well-drained soils. The vegetation shows zonation, changing gradually as one moves away from the immediate coast into coastal sage scrub. Many plants and invertebrates are restricted to this environment and are not found elsewhere. One of these endemic organisms is the El Segundo Blue (*Shijimiaeoides battoides allyni*), a butterfly species. The distribution of this butterfly is entirely restricted to the El Segundo Dunes. Because of its rarity and highly limited range, the butterfly is officially recognized as an endangered species by the U.S. Fish and Wildlife Service. This small piece of dune habitat is extremely valuable as the final example of a community which was once more common than at present along the Los Angeles County and southern California coastline.

Ballona Creek (SEA 29)

Criteria 1, 2, 3, 4, 5, 7
Westside Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Venice. Ballona Creek is one of two remaining remnants of salt marsh between Ventura County and the Los Angeles-Orange County line.

This type of habitat is one of the most productive in the world, and is used as a breeding ground by many marine and terrestrial organisms. Belding's savannah sparrow, a state recognized endangered species, occurs in the pickleweed flats on the south side of the creek. The California least tern breeds in the sandy areas around Ballona Lagoon, and is recognized as an endangered species by the state and federal governments.

The salt marsh, Ballona Creek Channel, Ballona Lagoon, and Del Rey Lagoon form an important complex of habitats that are heavily used by migratory birds. The area is recognized by ornithologists and bird watchers throughout the area for its rich birdlife during the spring and fall migrations, and during the winter season. This type of heavy use is common in salt marsh habitat, but has been artificially increased here by the loss of habitat in Marina Del Rey, and throughout most of southern California. This forces these birds to concentrate in the few remaining areas. Loss of this habitat type has led to reductions in the numbers of these birds present along our coast.

The salt marsh and lagoon at Ballona Creek are heavily used by academic institutions and conservation groups for educational field trips. This area serves as a type specimen of salt marsh habitat, and is the only accessible example in Los Angeles County.

Alamitos Bay (SEA 30)

Criteria 1, 2, 3, 4, 5, 7
Gateway Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Los Alamitos. This area is one of two remaining examples of salt marsh found in Los Angeles County, and the last remnant of the extensive salt marshes once found in Los Alamitos Bay. The majority of this vegetation type has been lost to urbanization, flood control projects, harbors, and marinas. It is one of the most productive types of ecological communities that exists and is extremely important as a breeding ground for both terrestrial and marine organisms, including the majority of commercial fish. This is due in part to the fact that estuaries and salt marshes are the interface between the terrestrial and marine worlds, and are important nutrient cycling centers for marine ecosystems. It is probable that the Belding's savannah sparrow occurs here. This species is restricted to salt marsh habitat, and has been placed on the state endangered species list. This type of habitat is also important as a wintering ground for migratory birds.

Rolling Hills Canyons (SEA 31)

Criteria 3, 4, 5, 7
South Bay Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: San Pedro andTorrance. The Rolling Hills Canyons are one of the last remaining areas of natural vegetation on the Palos Verdes Peninsula. The geographical location and geological history of the peninsula make remaining habitat extremely valuable for ecological and scientific studies. The peninsula, which was an island in recent geological time, has close floral and faunal similarities to the channel islands. This feature makes all remaining native communities on the peninsula a natural research laboratory for the study of island biogeography and evolutionary ecology.

The vegetation in these canyons is a complex of coastal sage scrub, chaparral, and riparian communities. This association is very diverse, and supports a good complement of native species. Among these are at least three races of bird species that are resident on the peninsula, and found nowhere else except the Channel Islands. These are the insular forms of the orange-crowned warbler, western flycatcher, and Allen's hummingbird. The same phenomenon has been documented for plant species.

These small fingers of vegetation are also exceedingly important as an area for migratory birds. The peninsula is a headland that juts into the Pacific several miles further than the surrounding coastline. Migrating terrestrial and marine birds flying over the open ocean on their north-south migration along the Pacific Flyway, spot this headland and stop to rest and feed. Many of these birds will stay, and spend the winter in the area. Thus, the geographic position of these small canyons make them much more important than might otherwise be expected.

Agua Amarga Canyon (SEA 32)

Criteria 3, 4, 5, 7
South Bay Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Redondo Beach. Agua Amarga Canyon is the last remaining relatively undisturbed drainage on the coastal side of the Palos Verdes Peninsula. The geographical location and geological history of the peninsula make remaining habitat extremely valuable for ecological and scientific studies. The peninsula, which was an island in recent geological time, has close floral and faunal similarities to the Channel Islands. This feature makes all remaining natural habitat on the peninsula a natural research laboratory for the study of island biogeography and evolutionary ecology.

The vegetation in Agua Amarga Canyon is a complex of coastal sage scrub, chaparral, and riparian communities. This association is very diverse, and supports a good complement of native species. Among these are at least three races of birds resident on the peninsula, that are found nowhere else except the channel islands. These are the insular form of the orange-crowned warbler, western flycatcher, and Allen's hummingbird. The same phenomenon has been documented for plant species.

The canyon is also exceedingly important as an area for migratory birds. The peninsula is a headland that just into the Pacific several miles further than the surrounding coastline. Migrating terrestrial and marine birds flying over the open ocean on their north-south migration along the Pacific Flyway, spot this headland and stop to rest and feed. Many of these birds will stay and spend the winter in the area. Thus, the geographic position of the canyon makes it much more important than might otherwise be expected.

Terminal Island (SEA 33)

Criteria 1, 2, 3, 4, 5, 7
South Bay Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: San Pedro. The California least tern (*Sterna albifrons brownii*) nests at this locality. This species is found along the southern California coast from April to September, and breeds in flat sandy areas lacking vegetation. It must be free from disturbances,

and near an estuary with a good supply of small fish. This type of habitat was once common along the coast of southern California, but has nearly disappeared as estuaries have been filled and channelized, and sandy beaches have become a favorite southern California recreation area. For these reasons this species has been placed on the state and federal endangered species list. Nesting populations are found from San Francisco Bay south, with the majority being bound in Orange and San Diego counties. In Los Angeles County, nesting colonies have been found irregularly at scattered localities with populations breeding regularly on Terminal Island and at Ballona Creek.

Palos Verdes Peninsula Coastline (SEA 34)

Criteria 2, 3, 4, 5, 6, 7
South Bay Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Redondo Beach and San Pedro. Unparalleled headlands, rocky shoreline, and the land-sea interface provide for a tremendous variety of biotic resources in this area. It is one of the most biologically diverse and productive regions in Los Angeles County, and contains several biotic communities including rocky intertidal, kelp bed, coastal strand, and coastal sage scrub. One small sandy beach is periodically present on an ephemeral basis at Portuguese Bend. This ten mile stretch of coastline, between Point Fermin and Bluff Cove, is the only sizeable rocky intertidal area in the county.

Rocky shores support a great number of species. This is primarily due to the highly diverse, oxygen and food-rich environment offered by this habitat. These features are provided by the stability and variety of substrates present, the aeration of water through wave splash, and the upwelling of nutrient-rich waters along the southern California coast.

Kelp beds dominated by giant kelp (*Macrocystis pyrifers*), are found in some locations in the area. These have tremendous value to the biota of inshore areas. Where they occur they may locally account for 90% of the biomass. They provide food and habitat for hundreds of species. Many of the species this habitat supports are the basic component of the food chains of inshore fishes. Kelp beds are also important because they reduce wave shock to shorelines. This protection helps maintain the abundance and complexity of marine life found there.

Kelp beds were originally common off the southern California coast wherever rocks were present at shallow depths. However, due to man-made and natural phenomena, this habitat has been severely diminished in the region, and is now rare in Los Angeles County. A kelp bed habitat restoration program has begun in the area, and kelp has been reestablished at abalone Cove and Halfway Point. Smaller colonies are now reestablishing elsewhere.

The coastal cliffs found in the area range in elevation from 100 to 300 feet and support coastal sage scrub and coastal strand. These and offshore rocks offer ideal roosting and feeding sites for numerous shorebirds, gulls, and other seabirds, including the endangered brown pelican. The area is an important stop for migrating birds as they fly along the coast or across the Santa Monica Bay. In addition, the bluff tops which are now abandoned agricultural fields, are utilized by many species as wintering feeding grounds. One endangered

species, the peregrine falcon, and one very uncommon species, the prairie falcon, have been known to winter here in recent years.

Madrona Marsh (SEA 36)

Criteria 3, 4, 5, 7
South Bay Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Torrance. Madrona Marsh is a remnant of the wetlands that once covered the South Bay area. The freshwater plants and animals found here are completely surrounded by residential and industrial development. This type of habitat has been filled, drained, and lost to development throughout most of Los Angeles County. In some areas, man-made lakes and ponds have created small fresh-water marshes along their edges, but this is minimal when compared to the large expanses of fresh water marsh that were once found in the Los Angeles Basin.

Freshwater marsh habitat supports a great diversity of wildlife. Most of the bird species found here are dependent in some way on the surface moisture and vegetation, and would not be able to survive without it. It is also a habitat that supports several species of amphibians. Frogs and toads can be found here that are becoming extremely difficult to find throughout southern California. The marsh is also an important area for migratory birds. Because Madrona Marsh and Harbor Lake Regional Park are the only habitat of this type in southern Los Angeles County, they serve as miniature wildlife refuges. Waterfowl, shorebirds, marsh birds, and others can all be found on the marsh in numbers during the spring and fall migration.

Griffith Park (SEA 37)

Criteria 7
Metro Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Hollywood and Burbank. Griffith Park lies at the eastern end of the Santa Monica Mountains. It supports the coastal sage scrub, chaparral, riparian, and southern oak woodland plant communities that are typical in the interior mountain ranges of southern California. What makes Griffith Park important is its geographical location. It has become an island of natural vegetation surrounded by urban and suburban development.

These isolated areas are important for preserving and documenting the geographical variability of vegetation and wildlife that formerly occurred throughout the region. They serve as reservoirs of native species that could be of scientific and economic value in the future. In addition, birds rely on these islands for areas to rest and feed along their north-south migration routes. In the case of Griffith Park, this function is made even greater than might be expected because it serves as a corridor for any gene flow and species movement that may still take place between the Santa Monica and San Gabriel Mountains via the Verdugo Mountains.

Encino Reservoir (SEA 39)

Criteria 7
San Fernando Valley Planning Area, Westside Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Canoga Park and Topanga. This area contains the best undisturbed stand of inland chaparral, coastal sage scrub, and streamside vegetation remaining on the inland slope of the Santa Monica Mountains. In addition, there is freshwater habitat along the Encino Reservoir.

The absence of moist marine air influences gives the vegetation types found here characteristics that are considerably different than those found in similar communities on the coastal side of the mountains. The species present and their composition vary significantly.

The association between the freshwater habitat and surrounding vegetation enhances the diversity and abundance of wildlife. Under these conditions, the overlap of habitats provides a greater number of resources than are provided by each habitat alone.

Verdugo Mountains (SEA 40)

Criteria 7
San Fernando Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Burbank, Sunland, and Pasadena. The Verdugo Mountains are an extensive, relatively undisturbed island of natural vegetation in an urbanized metropolitan area. Their geographic location makes them important for scientific study, genetic interchange between otherwise isolated populations, and recreation to urban residents.

Chaparral and coastal sage scrub cover the hillsides of the mountains, with riparian vegetation, including California bay, sycamore, ferns, and tiger lilies, found in many of the stream drainages. These plant communities provide habitat essential to the diverse and abundant fauna found in the area.

The area serves as an island refuge, providing what remains of a link between plant and animal populations found in the Santa Monica and San Gabriel Mountains. Genetic interchange, by way of this linkage is important in perpetuating the genetic variability in isolated populations, and consequently the maintenance of healthy ecosystems.

The proximity of the mountains to urban areas provides an excellent opportunity to study the interaction between wild animal populations and humans. The area has already been used for studies concerned with public health.

Whittier Narrows Dam County Recreation Area (SEA 42)

Criteria 3, 4, 5, 7
West San Gabriel Valley Planning Area, Gateway Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: El Monte. The Whittier Narrows Dam County Recreation Area contains an extensive area of excellent lowland riparian and freshwater marsh habitat, most of which has been set aside as a wildlife refuge. A nature center with excellent educational and interpretive facilities has been established on the property, and successful habitat restoration and management programs have been implemented.

The area is located in the southern San Gabriel Valley along the San Gabriel and Rio Hondo Rivers. The area is a low flood plain with a high water table and rich soils. The adjacent portions of the San Gabriel River and most of the Rio Hondo remain in a fairly natural state, supporting impressive streamside vegetation of willows, sycamores, cottonwoods, and mulefat. In addition, there are several lakes in the area which support freshwater marsh vegetation. Many of these habitat areas are protected within the nature center boundaries.

The area provides habitat for a very rich and diverse vertebrate fauna, including 24 species of mammals, 240 species of birds, 8 reptiles, 4 amphibians, and several fish. Many of these are restricted to riparian and freshwater marsh habitats and are uncommon in Los Angeles County.

The nature center provides educational and interpretive programs with a nature trail system, museum, and tours for school children. It also includes a habitat restoration program where replantings with natives and re-introduction of wildlife are reestablishing a natural balance in areas previously affected by man.

Rio Hondo College Wildlife Sanctuary (SEA 43)

Criteria 8
Gateway Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: El Monte. This area has been designated as a Significant Ecological Area because it is currently used as a wildlife sanctuary by the faculty and students at Rio Hondo College. The area possesses good examples of the riparian woodland, chaparral, oak woodland, and coastal sage scrub communities found in the west end of the Puente Hills. Its proximity to the Rio Hondo College campus makes it a highly valuable educational and resource facility.

The biotic communities here contain a variety of plant life and an abundant fauna, including over 100 species of vertebrates. The biological resources of the sanctuary are widely used by students at the college. Only minutes from campus, it is an excellent natural classroom and laboratory.

Sycamore and Turnbull Canyons (SEA 44)

Criteria 7
East San Gabriel Valley Planning Area, Gateway Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: El Monte, Whittier, and La Habra. These canyons and adjacent ridges possess one of the finest undisturbed examples of natural vegetation remaining in the Puente Hills. In addition, Sycamore Canyon contains a stream that usually flows year-round, and supports one of the best examples of riparian woodland found in the region.

A variety of plant communities is found in the area including riparian woodland, oak woodland, coastal sage scrub, and chaparral. The lush riparian vegetation provides food, nesting sites, and cover for many animals. The surrounding undisturbed vegetation is extensive enough to enable uncommon species like deer, coyote, bobcat, and badger to frequent the area.

Dudleya densiflora Population (SEA 45)

Criteria 2, 3, 5, 7
East San Gabriel Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Azusa. *Dudleya densiflora*, the San Gabriel Mountain live-forever, is recognized as rare and endangered by the California Native Plant Society. This species is highly restricted in distribution, found only at the mouth of the San Gabriel River Canyon, and other nearby canyons in Los Angeles County. It grows in chaparral on rocky cliffs between 800 and 2000 feet. This population, found on a north-facing slope near the mouth of San Gabriel River Canyon is outside the National Forest and should be protected.

Edwards Air Force Base (SEA 47)

Criteria 1, 3, 5, 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Mt. Mesa, and Redman School. This area contains botanical features that are unique and limited in distribution in Los Angeles County. They include an officially recognized endangered species, the Mojave spineflower (*Chorizanthe spinosa*), and the only good stands of mesquite (*Prosopis glandulosa*) in the County. In addition, the area possesses fine examples of alkali sink and creosote bush scrub communities.

Chorizanthe spinosa is a declining California endemic. Its range includes portions of the western Mojave Desert where it is found in dry, sandy, gravelly places from 2500 to 3500 feet. This species has recently been identified and located in the area just southeast of Buckhorn Lake.

Mesquite is commonly found in washes and low places in the drier portions of southern California. However, this species is limited in Los Angeles County. In many places where it does occur, stands are small and thin. The stands within this area are extensive and dense.

The area contains fine examples of creosote bush scrub, alkali sink, and the transition vegetation between the two. Creosote bush scrub is a common plant community and covers the floors and lower slopes of southern California deserts. It consists of a shrubby vegetation dominated by creosote bush (*Larrea tridentata*), burrobush (*Ambrosia dumosa*), and brittle bush (*Encelia farinosa*). The alkali sink community is found in alkaline flats and low places with little or no drainage. The plants found here are adapted to salty soils. They include pickle-weed (*Salicornia* sp.), saltbush (*Atriplex* sp.), and saltgrass (*Distichlis* sp.). The flora and fauna making up this biotic community are unique to it, and are not found outside this habitat.

Big Rock Wash (SEA 48)

Criteria 4, 5, 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Littlerock, Lovejoy Butte, and Valyermo. Desert wash areas are important because they provide critical wildlife habitat and migration corridors, and a means of seed dispersal for many desert plants. In addition, they commonly possess a much greater diversity than surrounding areas, and are important to the stability of many desert ecosystems.

Big Rock Wash is a large and relatively undisturbed example of desert wash. shadscale scrub, creosote bush scrub, and desert riparian plant communities are found within the area. The wash extends from the San Gabriel Mountains out into the Mojave Desert. Many montane species have extended their range a short distance into the desert along the wash. The unique ecological relationships created by these extensions are of scientific interest to ecologists.

The diverse and comparatively dense plant growth found here provides concentrated nesting habitat for most desert avian species. In desert area, habitat of this nature is found in washes only, and is therefore limited in its availability.

In addition, the area supports a surprising variety and abundance of mammals. The wash banks provide burrowing and denning areas for many species, and the wash vegetation provides necessary cover.

The use of Big Rock Wash as a wildlife migration corridor and as a means of plant seed dispersal is highly significant. In this manner, the area helps to maintain the floral and faunal diversity of surrounding areas. Furthermore, the wash terminates in a group of buttes. Dispersal of organisms into and from the buttes is critical to their functioning as a reservoir of biotic diversity.

Little Rock Wash (SEA 49)

Criteria 4, 5, 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Lancaster East, Palmdale, Little Rock, and Pacifico Mountain. Desert washes are very important ecological units because they provide essential wildlife habitat and migration corridors, and a means of seed dispersal for many desert plants. In addition, they are commonly much more diverse than surrounding areas and are important to the stability of many desert ecosystems.

Little Rock Wash is the largest and least disturbed habitat of this type in the county. It contains shadscale scrub, creosote bush scrub, and desert riparian habitats. The wash runs from the San Gabriel Mountains out into the Mojave Desert. Many montane plant and animal species have extended their distributions a short distance into the desert by way of the wash. The unique ecological relationships created by these extensions are of scientific interest to ecologists.

The diverse and comparatively dense vegetation found here provides concentrated nesting habitat for a surprising number of bird species. In the desert, habitat of this nature is found in wash areas only, and is therefore limited in its availability.

In addition, the area supports an impressive variety and abundance of mammals. The arroyo bank provides burrowing and denning areas for many species, and the wash vegetation provides necessary cover.

The use of Little Rock Wash as a wildlife migration corridor and a means of plant dispersal is of great ecological importance. This function helps to maintain the floral and faunal species complement in the surrounding areas.

Rosamond Lake (SEA 50)

Criteria 2, 3, 5, 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Rosamond Lake and Rosamond. Rosamond Lake is the best example of the shadscale scrub and alkali sink biotic communities in Los Angeles County. It is also the southern most extension of the Great Basin kangaroo rat (*Dipodomys microps*), and is therefore of scientific value. This species and the shadscale scrub plant community are uncommon in California south of the Owens Valley.

The shadscale scrub plant community is found in heavy soils with underlying hardpan, between 3000 and 6000 feet elevation. Vegetation consists of low shrubs including many uncommon species generally found only in the extreme northern Mojave Desert and Owens Valley. The alkali sink plant community is primarily composed of a half dozen salt tolerant species, and presents a rather barren landscape. It can be found on or near salt pans throughout the Mojave Desert.

The Great Basin kangaroo rat has a range covering most of Nevada and portions of California, Oregon, Idaho, Utah, and Arizona. The population at Rosamond Lake is geographically isolated and should be preserved for scientific study. In addition, it is one of the few places this species is know to occur in southern California and the only known locality in Los Angeles County.

Saddleback Butte State Park (SEA 51)

Criteria 7, 8
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Hi Vista. This area possesses important desert butte habitat. In addition, it includes most of Saddleback Butte State Park, and is the only one of its kind that is currently protected from development.

In general, desert buttes maintain increased biological diversity over surrounding areas and possess ecological importance as vital habitat to many desert dwelling species. In addition, they serve as critical refuges for many biological resources that are disappearing in the county due to urban and agricultural expansion. These

functions can continue for Saddleback Butte as long as its integrity is maintained. The buffer zone is important for this purpose.

The area also possesses valuable resources of its own. These include undisturbed examples of desert wildflower habitat, Joshua tree woodland, creosote bush scrub, and desert wash. It is possible that the Mojave ground squirrel inhabits the area. The status of this officially recognized rare species within the area should be determined. Its presence would require the area to be classified as class 1.

Alpine Butte (SEA 52)

Criteria 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Alpine Butte, Hi Vista, and Littlerock. Increased biotic diversity over surrounding areas and ecological importance as vital habitat to many desert-dwelling species are general characteristics of desert buttes. In addition, they often possess biological resources that are declining in Los Angeles County due to increased agricultural and urban development.

Alpine Butte is the least disturbed butte habitat in the county. It contains excellent stands of joshua tree woodland and creosote bush scrub. Impressive desert wildflower habitat, now disappearing in the county, is also found in the area.

The number of species present in butte areas is high. This is the result of an increased number of niches available. Sand from the surrounding desert floor is carried by wind up into the buttes, creating a mixture of sandy and rocky habitats. This permits both sand - and rock-inhabiting plant and animal species to occur in a very localized area.

To many wide-ranging animals, buttes are critical habitat. Many birds of prey use the buttes for roosting and nesting. Several large mammal species, which forage in outlying areas, use buttes for denning sites and cover. Without buttes, these species could not exist in many regions of the desert.

This area is potential habitat for the Mojave ground squirrel. This species, once locally common in Los Angeles County, is now officially recognized as rare by the State Department of Fish and Game. The status of the Mojave ground squirrel at Alpine Butte should be determined. If this species is present, the area should be reclassified as class 1.

Like the Mojave ground squirrel, many biological resources are declining in the county's desert regions. Most of these resources are now common only on the buttes and immediately surrounding lands. Preservation of these areas is essential for the maintenance of biotic diversity in the county.

Lovejoy Butte (SEA 53)

Criteria 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Lovejoy Butte and Littlerock. In general, desert buttes possess increased biotic diversity over surrounding areas and ecological importance as vital habitat to many desert-dwelling species. In addition, they serve as critical refuges for many biological resources that are now disappearing in Los Angeles County due to increased urban and agricultural development.

Lovejoy Butte contains Joshua tree woodland and creosote bush scrub vegetation. On buttes, these communities often have a more diverse flora and fauna than the desert floor. This is the result of an increase in the number of niches available. Wind-blown sand from the desert floor settles in the buttes, creating a mixture of both rocky and sandy habitats. This permits rock- and sand-dwelling species to occur in a very localized area.

Desert buttes are critical habitat to many birds of prey and large mammals. These wide-ranging species forage in the surrounding desert areas, but use the buttes as essential roosting, nesting, denning and refuge areas.

Most buttes in the county are potential habitat for the Mojave ground squirrel. This rare species is officially recognized by the California Department of Fish and Game. Once fairly common in localized areas, increased urban and agricultural development have caused its decline. This species' status at Lovejoy Butte should be determined. If it is present, the area should be reclassified into classification 1.

Like the Mojave ground squirrel, many biological resources are declining in the county's desert lands. Most of these resources are now common only in buttes and immediately adjacent areas. Preservation of these land is essential for the maintenance of biotic diversity in the county.

Piute Butte (SEA 54)

Criteria 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Hi Vista. Desert buttes are generally characterized as having increased biotic diversity over surrounding areas and are ecologically important as vital habitat to many desert-dwelling species. Additionally, they serve as critical remnants of many biological resources that have been diminished in Los Angeles County by urban and agricultural expansion.

Joshua tree woodland and creosote bush scrub are found on Piute Butte. In butte areas, these communities commonly possess a more diverse flora and fauna than the desert floor. This is due to an increased number of niches. Wind carries sand from the desert floor up onto the buttes, creating a mixture of sandy and rocky habitats. This allows both sand- and rock-dwelling plant and animal species to exist in a very localized area.

To many wide-ranging birds of prey and large mammals, desert buttes are critical habitat. These animals forage in the surrounding areas but use the buttes for roosting, nesting, denning, and refuge. Without the buttes these species would not be present in many regions of the desert.

Many of the buttes in Los Angeles County are potential habitat for an officially recognized rare species, the Mojave ground squirrel. this species was once fairly common in butte areas in the county. However, accelerated urban and agricultural expansion has caused it to decline. Its status at Piute Butte should be investigated. This species' presence would require the area to be reclassified as class 1.

As in the case of the Mojave ground squirrel, many biological resources are declining in the county's desert lands. Most of these resources are now common only on buttes and in areas immediately surrounding them. Preservation of these areas is essential for the maintenance of biotic diversity in the county.

Desert-Montane Transect (SEA 55)

Criteria 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Mescal Creek and El Mirage. The Desert-Montane Transect (SEA No. 55) possesses vegetation types that are representative of the transition between the Mojave Desert and the north slopes of the San Gabriel Mountains. The combination of desert and montane habitats makes this one of the most diverse areas within Los Angeles County, and one of the largest undisturbed areas outside the Angeles National Forest.

Desert communities include creosote bush scrub, sagebrush scrub, and Joshua tree woodland. Creosote bush scrub is found on the desert floor and in the butte areas. Sagebrush scrub and Joshua tree woodland are found above the floor in the broad alluvial fans and at the base of the rocky foothills. The sagebrush scrub community is limited in distribution in southern California. Pinyon-juniper woodland and desert chaparral habitats are found in the foothills and the lower mountain slopes. At higher elevations, a mixed conifer forest occurs, with Jeffrey pine (*Pinus jeffreyi*), ponderosa pine (*Pinus ponderosa*), and big-cone spruce (*Pseudotsuga macrocarpa*) as the dominant species.

Despite the commonness of most of these communities, the area is very valuable because it is the only site where these communities can be found in an uninterrupted band running from the crest of the San Gabriel Mountains to a desert butte. This feature creates an outstanding opportunity for educational use and scientific research. Preservation of this area will also serve as a reservoir in maintaining the diversity of surrounding desert, foothill, and mountain ecosystems.

The area is relatively large, and precise locations of its most unique resources are not known. For this reason, the priority category assigned to the SEA reflects the value of the area as a means of preserving biodiversity. Further studies are needed to determine the exact locations of the more unique resources. Areas containing sagebrush scrub should be identified and placed in category 2. Additional highly valuable resources should be identified and rated accordingly.

Ritter Ridge (SEA 56)

Criteria 5, 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Ritter Range. The vegetation on Ritter Ridge is a cross-section of several unspoiled habitats of the desert and foothills. It has one of the finest mixed stands of Joshua trees (*Yucca brevifolia*) and California junipers (*Juniperus californica*) in the County. The area is also an excellent wildlife region possessing a rich fauna.

Ritter Ridge lies between the Sierra Pelona foothills and the Antelope Valley. The vegetation grades into an excellent Joshua tree woodland and California juniper association on the northern slopes. On the higher northern slopes and on the south-facing slopes are fine examples of desert chaparral. This is an excellent combination of desert and foothill plant species, and makes the area valuable for educational and scientific reasons.

Ninety-seven resident vertebrate species have been recorded from the ridge. These include 25 mammals, 53 birds and 19 reptiles. The area is also known as an important refuge for migratory birds.

Fairmont and Antelope Buttes (SEA 57)

Criteria 4, 5, 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Lake Hughes, Little Buttes, Fairmont Butte, and Del Sur . In general, desert buttes possess increased biotic diversity over surrounding areas. This is due to a high number of niches being created by mixing sandy and rocky habitats. These areas are also vital habitat to many wide ranging species which forage in outlying habitat, but use the buttes for nesting, roosting, denning, and refuge. In addition, they often possess biological resources that are declining in Los Angeles County due to accelerated agricultural and urban development. However, there are additional features which make the Fairmont and Antelope Buttes valuable.

These buttes are the most westerly habitat of this type in the Mojave Desert. Due to the non-uniform distribution of species and the proximity of these buttes to the San Gabriel Mountains, the species composition on them is likely to be different than that found on other butte habitats in the desert. The unique ecological relationships created by these features are of scientific interest.

The buttes also serve as concentrated wintering grounds for birds of prey. They provide excellent roosting sites surrounded by cultivated fields which support a plentiful food supply of rodents, rabbits, and hares. Concentrated raptor habitat of this type is uncommon in Los Angeles County.

Portal Ridge/Liebre Mountain (SEA 58)

Criteria 5, 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Lake Hughes, Neenach School, Burnt Peak, La Liebre Ranch, Lebec, and Liebre Mtn.The Portal Ridge/Liebre Mountain area is in close proximity to the Mojave Desert, the San Gabriel Mountains, and the Tehachapi Foothills. This position, at the intersection of three major geographical regions has produced the most diverse and unique flora found in the county. The area contains ten distinct plant communities, representing the transition between desert, foothill, and montane environments. The diversity of the area is further enhanced by the presence of many northern species, some of which are rare in the county, reaching their southern limit here.

Foothill woodland is an uncommon plant community that occurs in this area. It is a community containing both oak parklands of blue oak (*Quercus douglasii*) and valley oak (*Q. lobata*), and digger pine woodland (*Pinus sabiniana*). This community is more common in northern and central California where it occurs along foothill and valley borders in the inner Coastal Ranges and western foothills of the Sierra Nevada. The distribution of this community extends south through the Tehachapi Mountains to the San Gabriel Mountains to reach its southern limit on Portal Ridge/Liebre Mountain. This is the only place this community is found in the county. Similarly, several of the component species including blue oak, digger pine, and California buckeye reach their south limits here, and are found nowhere else in the county.

On the lower slopes and in the valleys south of the main ridgeline, southern oak woodland, valley grassland, riparian woodland, and coastal sage scrub can be found. Higher slopes and ridgetops are covered with chaparral and yellow-pine forest. On the north-facing slopes, which are under desert influences, pinyon-juniper woodland habitat is present. Joshua tree woodland or sagebrush scrub cover the lower desert hillsides in the area.

All of these communities are relatively common in the county with the exception of sagebrush scrub. This community, dominated by great basin sage (*Artemisia tridentata*), is not common in California south of the Owens Valley. Populations in southern California are probably relics from an earlier time when the community extended much further south than it does today.

Despite the commonness of most of the plant communities present, this area is very valuable because it possesses such a concentrated diversity of vegetation types. This creates an outstanding opportunity for educational use, nature study, and scientific research.

The Portal Ridge/Liebre Mountain area is relatively large, and the precise locations of its most unique resources are not known. For this reason, the priority group assigned to it reflects only the value of the entire area for scientific research. However, further studies should be conducted to determine the exact location of the more unique resources within the area. Those containing sagebrush scrub should be identified and placed in priority group 2. Foothill woodland habitat should also be set apart and given a priority group 3 rating. Additional highly valuable resources should be identified and rates as they are found. Enough of the area should be preserved so that the interface between the communities can be maintained.

Tehachapi Foothills (SEA 59)

Criteria 5, 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Lebec and Frazier Mountain. The grassy, south-facing slopes of these hills are one of the best foothill wildflower sites in southern California. In addition, the area is located at the junction of the Mojave Desert, the transverse ranges, and the Tehachapi Mountains, and possesses floral and faunal components from each region. As a result, the area is extremely diverse and contains many unique ecological relationships of scientific value.

The herbland vegetation of the area consists primarily of herbs and forbs. Characteristic plant species include buttercup, poppy, owl's clover, and many species of sunflowers. Spectacular wildflower displays are common here.

Several other plant communities are found in the area. These include chaparral, riparian woodland, foothill woodland, southern oak woodland, and valley grassland. This variety of habitats, and the overlap of mountain and desert influences, make the area very valuable.

Joshua Tree Woodland Habitat (SEA 60)

Criteria 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Neenach School and Fairmont Butte.This area supports an excellent example of joshua tree woodland habitat. Due to accelerated agricultural and urban expansion in the County's desert regions, large dense stands of this habitat are becoming scarce, especially in the western Antelope Valley.

Joshua tree woodland occurs between 2500-4000 feet from the extreme western end to the extreme eastern end of the Mojave Desert. The dominant species is joshua tree, which reaches heights of 5 to 12 meters. Other common species include Mojave yucca, sage, box-thorn, and buckwheat.

Kentucky Springs (SEA 61)

Criteria 2, 3, 5, 7
Antelope Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangles: Acton and Pacifico Mountain. This area contains the best stand of great basin sage (*Artemisia tridentata*) remaining in Los Angeles County, and is one of the best in southern California. In addition, this stand and others in the county support a distinct subspecies of great basin sage (*A. t. parishii*), and are of scientific interest for the study of geographic variation.

Although great basin sage is widespread in the western states, it is very limited in southern California. It is infrequently found from San Diego County north along the western edges of the deserts to the Sierra

Nevada. In Los Angeles County is known only from a few isolated locations in the Santa Clara River Valley and the Antelope Valley. These are probably relics from an earlier time when the community covered much of southern California.

At present, large, relatively undisturbed stands of *A. t. parishii* exist in the area. However, these are threatened. Numerous roads, an electric company substation, power-lines, and many scattered houses have been developed, and continued development is probable.

Galium grande Population (SEA 62)

Criteria 1, 2, 3, 4, 5, 7
West San Gabriel Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Azusa. *Galium grande*, an endemic species of bedstraw, is recognized as endangered by the United States Fish and Wildlife Service. This species is highly restricted in distribution, being found only at isolated localities on the south slope of the San Gabriel Mountains. This population is in Sawpit Canyon, and is the only place it can be found outside the Angeles National Forest.

Lyon Canyon (SEA 63)

Criteria 7
Santa Clarita Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Oat Mountain. The site consists of a relatively narrow canyon housing both an oak woodland along with an extensive chaparral community. The oak woodland is found in the southerly portion of the area and contains both coast live oak (*Quercus agrifolia*) and the valley oak (*Q. lobata*). Further north up the canyon is found the chaparral community consisting of sugar bush (*Rhus ovata*), California lilac (*Ceanothus* species), black sage (*Salvia mellifera*), mule fat (*Baccharis salicifolia*) and chamise (*Adenostoma fasciculatum*), which is the dominant shrub.

Valley Oaks Savannah, Newhall (SEA 64)

Criteria 7
Santa Clarita Valley Planning Area

This SEA is located within the following USGS 7.5' topographic quadrangle: Newhall. This area contains one of the last remaining stands of valley oak (*Quercus lobata*) in the Santa Clarita Valley. The site consists of such specimens scattered over the southerly 75% of the site. While the trees generally appear to be healthy, there is little evidence of new trees on the property, which raises questions about their sustainability.

The northerly 25% of the site consists of a mixture of plants from coastal sage scrub and chaparral affinities typical of those found in the Santa Clarita Valley. The entire area is the habitat of coyote, deer and other animal life.

Biological Resources

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Appendix H8
Proposed SEA Descriptions

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LOS ANGELES COUNTY GENERAL PLAN

APPENDICES

Appendix E: Conservation and Natural Resources Element Resources

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Appendix E: Conservation and Natural Resources Element Resources

I. Open Space and Natural Areas in Los Angeles County

Los Angeles County offers a wide variety of open space and natural areas. The following open space and natural areas are managed by the County or are located primarily within the unincorporated areas:

Angeles National Forest

The Angeles National Forest was established by Executive Order in 1892 and is managed by the U.S. Forest Service. The Forest covers over 650,000 acres. The Angeles National Forest manages the watersheds within its boundaries to provide water to Southern California and to protect surrounding communities from catastrophic floods. The land within the Angeles National Forest is diverse in appearance and terrain, and provides many opportunities for recreational and scenic enjoyment. Much of the Angeles National Forest is covered with dense chaparral, pine and fir covered slopes as elevations in the Angeles National Forest range from 1,200 to 10,064 feet.

Deane Dana Friendship Park

Deane Dana Friendship Park, which is a 123-acre park located on the Palos Verdes Peninsula, affords dramatic panoramic views of Santa Catalina Island, Los Angeles and Long Beach harbors, the City of Los Angeles to the north, and the San Gabriel and San Bernardino mountain ranges. There are hiking trails throughout the park.

Devil's Punchbowl Natural Area

Devil's Punchbowl is a 1,310-acre natural area that consists of rugged wilderness rock formations along the San Andreas Fault on the northern slope of the San Gabriel Mountains. The terrain climbs from 4,200 feet to 6,500 feet in elevation, with natural plant and animal communities ranging from desert scrub to pine forests.A seasonal stream runs through the natural area.

Eaton Canyon Natural Area

Situated at the base of Mt. Wilson, this 190-acre natural area contains several plant and native habitat communities. Eaton Creek flows through the Canyon during all but the summer months. The 7,600squarefoot nature center contains displays of local flora and fauna, ecosystem concepts and live animals. The natural area offers five miles of nature trails and an equestrian trail, and serves as a trailhead to the Mt. Wilson Toll Road and Henninger Flats.

High Desert Wildlife and Wild Flower Sanctuaries

The County currently operates eight wildlife sanctuaries and one wildflower sanctuary in the high desert of Antelope Valley. Ranging from 2,500 to over 3,600 feet in elevation and encompassing more than 2,000 acres, the sanctuaries offer opportunities for spring wildflower viewing, bird watching, hiking and horseback riding. Wildlife seen on the preserves vary from horned lizards,

chuckwallas and rattlesnakes, to prairie falcons and golden eagles. Insect life is most abundant during the warmer months, and in spring, the Joshua tree and other large shrubs provide nesting sites for a variety of songbirds. Other protected animals are the kit fox, desert tortoise and Mojave ground squirrel.

Kenneth Hahn State Recreation Area

The 300-acre Kenneth Hahn State Recreation Area, managed by the County, includes large areas of native coastal sage scrub habitat, lawns and landscaped areas, picnic sites, tot lots, a fishing lake, a lotus pond, a community center, and five miles of trails. One of the most actively used features is the park's more than seven miles of footpaths and trails.

Michael D. Antonovich Open Space Preserve

The Michael D. Antonovich Open Space Preserve offers 500 acres of dedicated open space in the Santa Susana Mountains and is managed by the Mountains Recreation and Conservation Authority (MRCA). Located on the northern border of Los Angeles, this open space preserve contains a diversity of flora and fauna, from big cone Douglas fir, California walnut and oak trees to black bears, deer and mountain lions. The Preserve also provides important habitat connections through its numerous wilderness trails in the Rim of the Valley corridor of the Santa Clarita Woodlands Park.

Placerita Canyon Natural Area

This 350-acre natural area is located in an east-west running canyon featuring oak groves, chaparral-covered slopes and a sycamore-lined stream. Placerita Canyon is home to the Oak of the Golden Dream, where gold was "first" discovered in California in 1842, and Walker's Cabin,which is a relic of early frontier living. Placerita Canyoncontains eight miles of hiking trails.

Santa Monica Mountains National Recreation Area

The 150,000-acre Santa Monica Mountains National Recreation Area is a part of the National Park System, which encompasses the mountain range from the Oxnard Plain in Ventura County, past Topanga State Park to Franklin Canyon and the Hollywood Bowl in Los Angeles. The Recreation Area preserves natural habitats, historical and cultural sites, offers recreational opportunities, and acts to improve the air quality for the Los Angeles Basin. Covered by chaparral, oak woodlands, and coastal sage scrub, it is home to many species listed as rare, threatened, or endangered.

Santa Catalina Island Regional Park

Santa Catalina Island Regional Park consists of 41,000 acres of natural open space, with miles of hiking trails, camp sites and a wildlife sanctuary. The Santa Catalina Island Interpretive Center is located within the park.

Schabarum Regional Park

The 640-acres Schabarum Regional Park is comprised of open space and natural areas, including picturesque canyons and rolling hills for hiking, biking and horseback riding. Over 90 percent of this park has been left in its natural state for the public to enjoy.

Vasquez Rocks Natural Area Park

This 945-acre natural area is a hiking, picnicking, and equestrian area. The park is located in the high desert near Agua Dulce Springs and features rock formations, Tatavian Indian sites, and a seasonal stream. The principal plant communities are desert, chaparral, and riparian.

Whittier Narrows Natural Area

This natural area occupies approximately 300 acres in the southern portion of the Whittier Narrows Recreation Area. Bordering the San Gabriel River, the Natural Area is home to several habitats, with the dominant one being a riparian woodland. The southeastern portion of the site features four lakes that provide a winter sanctuary for migrating waterfowl and are opened by special permit for birding and photography. This area is near lakes and contains many plants and animals that are typically found within a wetland community.

II. Conservancies

The County works with various conservancies to maintain and protect open space land in Los Angeles County. Land conservancies are private, nonprofit organizations and public agencies that share a common goal: to conserve land for the benefit of people and nature. Land conservancies are generally started by community residents who wish to preserve a certain area or piece of open space land on a local or regional scale. Land conservancies have the flexibility to acquire, hold and manage land in the public interest, and also to preserve open space through voluntary conservation agreements with landowners, which permanently protect the land from development, while the title remains with the landowner. Most conservancies work in partnership with local governments and provide various levels of educational programs and land restoration and/or land enhancement projects.

The County works with a number of conservancies to preserve and protect the County's open spaces:

Antelope Valley Conservancy

The Antelope Valley Conservancy is a local land trust conservancy that obtains and stewards lands that are important to the community for quality of life, scenic beauty, and plant and animal habitat. AVC focuses on Joshua tree woodlands, the keystone species of the Mojave Desert, which supports a wide variety of native species. Most of the Conservancy's targeted preservation lands are in the County's designated Significant Ecological Areas. (http://www.avconservancy.org/)

Baldwin Hills Conservancy

The Baldwin Hills Conservancy (BHC) was created by the State in 2000. Specifically, BHC is responsible for: implementing the Baldwin Hills Park Master Plan; prioritizing and implementing acquisition of additional recreational and open space land for the expansion of Kenneth Hahn State Recreation Area; conducting planning activities for the area; and developing and coordinating a program of resource stewardship for optimum recreational and natural resource value based on the needs of the surrounding community. (http://www.bhc.ca.gov/)

California Coastal Conservancy

Established in 1976, the California Coastal Conservancy is a state agency that purchases, protects, restores, and enhances coastal resources, and provides access to the shore. The Conservancy works in partnership with local governments, other public agencies, nonprofit organizations, and private landowners. To date, the Conservancy has undertaken more than 1,800 projects along the 1,100 mile California coastline. (http://www.scc.ca.gov/)

Catalina Island Conservancy

In 1974, the Santa Catalina Island Company entered into a 50 year Open Space Easement agreement with the County, guaranteeing public recreational and educational use of 41,000 acres of Santa Catalina Island, consistent with good land conservation practices. The Santa Catalina Island Company subsequently deeded this land to the non-profit Catalina Island Conservancy (formed in 1972), along with an additional 1,135 acres. The Catalina Island Conservancy continues to manage 42,135 acres on Santa Catalina Island, providing the highest level of conservation protection to 88 percent of Santa CatalinaIsland. The Conservancy's mission is "to be a responsible steward of its lands through a balance of conservation, education and recreation." The conservation activities include wildlife management, a plant ecology program, invasive plant management, restoration of degraded areas and scientific research by many different researchers from throughout the country. Other activities include various educational camps for youth, several campgrounds and hiking and biking trails.(http://www.catalinaconservancy.org/)

Mountains Recreation and Conservation Authority

Established in 1985, the Mountains Recreation and Conservation Authority (MRCA) is a partnership between the Santa Monica Mountains Conservancy, the Conejo Recreation and Park District, and the Rancho Simi Recreation and Park District. The MRCA is dedicated to the preservation and management of open space and parkland, watershed lands, trails, and wildlife habitat. The MRCA manages almost 60,000 acres of public lands and parks, and provides comprehensive education and interpretation programs for the public. The MRCA works in cooperation with the SMMC and other local partners to acquire parkland, participate in vital planning processes, and complete major park improvement projects. The MRCA also provides natural resources and scientific expertise, critical regional planning services, park construction services, park operations, fire prevention, ranger services, and educational and leadership programs for youth. (http://www.mrca.ca.gov/)

Newhall Ranch High Country Recreation and Conservation Authority

The Newhall Ranch High Country Recreation and Conservation Authority is a joint powers authority formed by the SMMC, the County, and the City of Santa Clarita. Its purpose is the conservation and management of public open space lands set aside for habitat and recreation pursuant to the Los Angeles County Board of Supervisors approval of the Newhall Ranch project, the Westridge project, and any other such open space lands dedicated by Newhall Land Company or its successors. (http://smmc.ca.gov/NRHCRCA.asp)

Puente Hills Habitat Preservation Authority

The Puente Hills Habitat Preservation Authority (PHHPA) is a joint powers authority with a board of

directors consisting of the City of Whittier, the County, Los Angeles County Sanitation Districts, and the Hacienda Heights Improvement Association. The PHHPA was created in 1994 as mitigation for the Puente Hills Landfill. To date, the PHHPA manages 3,860 acres of preserved public open space. The PHHPA's main focus is to acquire the remaining open space within its jurisdiction, with special consideration given to the Hacienda Heights area. (http://www.habitatauthority.org/)

San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy

The San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy (RMC) was created by the State in 1999. RMC is one of nine conservancies within the California Resources Agency. Its mission is to preserve open space and habitat in order to provide for low-impact recreation and educational uses, wildlife habitat restoration and protection, and watershed improvements. RMC's territory covers eastern portions of Los Angeles County and western Orange County, which is a vast and varied area that includes mountains, valleys, rivers, coastal plain, and coastline. (http://www.rmc.ca.gov/)

San Gabriel Mountains Regional Conservancy

The San Gabriel Mountains Regional Conservancy is devoted to watershed management and a great variety of other projects in the San Gabriel River watershed of the eastern portion of Los AngelesCounty. Included in the region are the San Gabriel Mountains, the San Gabriel River valley and related areas. (http://www.sgmrc.org/)

Santa Clarita Watershed Recreation and Conservation Authority

The Santa Clarita Watershed Recreation and Conservation Authority (SCWRCA) was established in 1993 by the City of Santa Clarita and the Santa Monica Mountains Conservancy in order to cooperatively plan for the preservation of open space, trails, parkland, and watershed protection in the Santa Clarita area and the upper Santa Clara River watershed. In 2002, the SCWRCA finalized the City's and Conservancy's long-standing efforts to acquire the 442-acre Whitney Canyon Ranch. (http://smmc.ca.gov/SCWRCA.asp)

Santa Monica Mountains Conservancy

The Santa Monica Mountains Conservancy (SMMC) was established by the State in 1980. Since that time, it has helped to preserve over 60,000 acres of parkland in both wilderness and urban settings, and has improved more than 114 public recreational facilities throughout Southern California. Through direct action, alliances, partnerships, and joint powers authorities, the SMMC's mission is to strategically buy back, preserve, protect, restore, and enhance treasured pieces of Southern California to form an interlinking system of urban, rural and river parks, open space, trails, and wildlife habitats that are easily accessible to the general public. (http://smmc.ca.gov/)

Watershed Conservation Authority

The Watershed Conservation Authority (WCA) was created in 2003 as a joint powers entity of the RMC and the Los Angeles County Flood Control District. The focus of the WCA is on projects that will provide open space, habitat restoration, and watershed improvement projects in the watershedsofboththeSanGabriel River and the lower Los Angeles

River.(http://watershedconservationauthority.org/)

Wildlife Corridor Conservation Authority

The Wildlife Corridor Conservation Authority (WCCA) was established to provide for the proper planning, conservation, environmental protection, and maintenance of lands within the Puente-Chino Hills corridor area. Its goal is to assure that sufficient continuity of habitat can be preserved to maintain a functioning wildlife corridor made up of about 40,000 acres of land located between the Santa Ana Mountains and Whittier Hills. WCCA's governing board consists of representatives from the cities of Brea, Whittier, Diamond Bar, La Habra Heights, the Santa Monica Mountains Conservancy, California Department of Parks and Recreation, California Department of ~~Fish and Game~~Fish and Wildlife, the County, and two public members. (http://smmc.ca.gov/WCCA.html)

III. Regional Habitat Linkages

Habitat linkages are defined as area within the overall range of a species or suite of species that possess sufficient cover, food, forage, water and other essential elements to serve as a movement pathway, or between two or more larger areas of habitat. Depending on the species, linkages vary in size. For example, a belt of coastal sage scrub traversing a golf course, connecting sage scrub habitat areas on either side, providing a safe passage zone for smaller, slower-moving species (such as lizards and rodents) to maintain population connectivity between the two sides of the golf course isoneformofhabitatlinkage.

Wildlife corridors, which are areas of open space of sufficient width to permit larger, mobile species (such as foxes, bobcats and coyote) to pass between larger areas of open space, or to disperse from one major open space region to another, are another type of habitat linkage. Such areas are generally several hundred feet wide, unobstructed, and usually possess cover, food and water. The upland margins of a creek channel, open ridgelines, open valleys or the bottoms of drainages often serve as major corridors locally, as do riparian alignments.

Biological resources are important in a regional context, serving to connect resources in adjacent local jurisdictions. Critical biological resources are maintained through habitat connectivity, which sustains population genetic diversity, and provides refuge for migrant species. Regional habitat linkages are identified in the Conservation and Natural Resources Element. The Antelope Valley, Puente Hills, San Andreas, Santa Clara River, Santa Felicia, Santa Monica Mountains, and Santa Susana Mountains and Simi Hills SEAsserve as important regional habitat linkages. More details about linkages between and within each of these SEAs are provided below:

Antelope Valley SEA

The SEA extends from the Angeles National Forest to the playa lakes within Edwards Air Force Base, encompassing the whole of the two largest drainages exiting the northern slope of the San Gabriel Mountains. Its geographical features serve as a major habitat linkage and movement corridor for all wildlife species within its vicinity. Ecologically generalist species (such as bobcat, coyote, mule deer, fox, raccoon, etc.) have the ability to move across such vast areas and through-changing habitat types. For such species, the SEA may serve as an important system for long-term inter-populational genetic exchange. For smaller or less-mobile species, or taxa, which are more narrowly restricted in their habitat needs, the SEA can serve as a broad linkage zone, in which

individual movement can take place during seasonal or populational dispersal. This providesessential genetic exchange within and between metapopulations. The two drainages, combined with the upland terrestrial Desert-Montane transect portion of the SEA, ensure linkage values and direct movement zones for all of the wildlife species present within the County portion of the Antelope Valley.

Puente Hills SEA

Evidence of significant wildlife movement throughout the Puente Hills SEA has been documented in a two-year carnivore study commissioned by the Santa Monica Mountains Conservancy as part of a multi-jurisdictional effort to establish a regionwide wildlife movement linkage. This SEA represents the County portion of a continuous series of natural open space within the Puente Hills and Chino Hills. Overall, this open space extends north and west from State Route-91 in Orange and Riverside counties to the Whittier Narrows reach of the San Gabriel River. The Puente and Chino Hills are a natural, physical link between the Santa Ana Mountains and the San Gabriel River. The San Gabriel River flows from and links to the San Gabriel Mountains. By virtue of these linkages and a complex of interconnected habitat units, the Puente and Chino Hills function as both an important wildlife linkage and resident habitat area for regional wildlife populations.

San Andreas SEA

The San Andreas SEA includes several important linkages for wildlife movement. The Fault Zone connects with the Santa Clara River drainage in the Lake Hughes area, linking with this large, free-flowing watershed that extends to the Pacific Ocean in Ventura County. The foothills and grassland in the westernmost tip of the SEA are part of an important linkage between the San Gabriel Mountains and the Tehachapi Mountains. This linkage to the Tehachapi Mountains is important because it connects the southernmost extent of the Sierra Nevada Mountains with the San Gabriel Mountains and with the Southern Coast Ranges. The Tehachapi Mountains are the only mountain linkage between the Transverse Ranges and the Southern Coast Ranges to the Sierra Nevada Range. This largely natural area may be an important topographic reference for migrating birds and bats, as well as functioning for essential high elevation foraging grounds along their migration route. The Tehachapi Mountains further provide a valuable link for gene flow between divergent populations of many species, including plants. The SEA includes several large drainages that extend from the San Gabriel Mountains to the western end of the Mojave Desert: the Antelope Valley floor and the Fairmont and Antelope buttes. These washes provide an important linkage for animals traveling between the mountains (all the ranges mentioned above) and the Mojave Desert. In addition, Amargosa Creek facilitates east-west wildlife movement through Liebre Mountain, Portal Ridge, and Ritter Ridge to Barrel Springs in the Antelope Valley near the City of Palmdale. The frequency of valuable riparian communities along this travel route located within an otherwise arid climate, further indicates the importance of this area, which is one of the busiest natural wildlife linkages in the region.

Santa Clara River SEA

Historically (and prehistorically) the riparian corridor along the Santa Clara River has served as the primary east-west linkage between the Pacific coastline, Coast Ranges, interior ranges, high desert and southern Sierra (via the Tehachapi Range). Animals moving through the Santa Clara River at one time had unobstructed passage along the river and within its tributaries. The present

configuration of the tributary drainages has reduced connectivity from the Santa Clarita Valley to the north, but the Santa Clara River remains relatively intact and open. The SEA embraces the river corridor and the linkage zones that are considered essential to ensuring connectivity and resource values within the historic movement zones for all of the wildlife species present within the County portion of the Santa Clara River.

Santa Felicia SEA

Historically, riparian corridors have served as linkages between the Pacific coastline, Coast Ranges, interior ranges, the high desert and southern Sierras (via the Tehachapi Range). The Santa Felicia stream corridor likely serves the functions today. The elevation in this area is lower than that of the Los Padres National Forest, to the north, which facilitates animal movement within the riparian systems between Piru Lake in Ventura County and the San Gabriel Mountain Range in the County. The tributary drainages for Santa Felicia Creek within this SEA remain intact and unobstructed.

Santa Monica Mountains SEA

Although wildlife movement is hampered by rural development in the SEA, animals are still able to move through the Santa Monica Mountains in many areas. Due to its large size and topographic complexity, many linkages are certain to occur within the SEA at various bottlenecks. These linkages allow movement between large open space areas within the SEA, as well as between areas outside the SEA, such as the Simi Hills and the western extent of the Santa Monica Mountains in Ventura County. The genetic flow through these areas is crucial in maintaining the diversity and viability of certain species within the Santa Monica Mountains. Open space linkages between Kanan Road and Calabasas Parkway along State Route-101, as indicated by the National Park Service, are of particular importance for continued wildlife movement due to the lack of alternative routes and encroachment of development. Although there are significantly large open spaces within the SEA, contiguous habitat linkages between them are critical in reducing bottlenecks and providing for long-term sustainability.

Santa Susana Mountains and Simi Hills SEA

The Santa Susana Mountains and Simi Hills SEA includes several important linkages for wildlife movement. The Santa Susana Mountains and Simi Hills provide a vast open space corridor to foster wildlife movement between the Santa Monica Mountains to the south, San Gabriel Mountains to the east, and the Los Padres National Forest to the north. Dense, natural habitat associated with the majority of the study area provides excellent opportunities for concealment and water sources, while the grasslands provide an abundance of prey.

IV. Significant Ecological Areas

History of the SEA Program

Los Angeles County's Significant Ecological Areas (SEAs) Program has schematic roots in an initial General Plan guiding document, the 1970 Environmental Development Guide, which was adopted as a preliminary General Plan for the County. The Open Space Concept Plan and 1990 Open Space Policy Map depict greenbelt areas and rural lands that reasonably correspond to the current SEA map.

The original Significant Ecological Area Report was prepared in 1972 by scientists from the University of California, Los Angeles, the Los Angeles County Museum of Natural History and other local academic institutions, at the request of the Los Angeles County Department of Regional Planning (DRP). The DRP asked the report authors to identify "significant ecological areas," which due to their high biological resource value, should receive special consideration during the formulation of the 1973 General Plan. In the final report, 81 such areas were mapped and brief descriptions of the value of each were given. The 81 areas were then included on the Vegetation and Wildlife Map in the Conservation Element of the 1973 General Plan.

In 1976, following the 1975 court decision requiring the preparation of a revised General Plan, the DRP and the Environmental Systems Research Institute commissioned the Los Angeles County Significant Ecological Area Study (1976 SEA Study), from the environmental consulting firm, England and Nelson. After excluding the Channel Islands and national forest lands from the study area, the 1976 SEA Study reviewed the data and criteria used to establish the original significant ecological area list, analyzed new information, developed of a set of eight criteria to be used to select and prioritize significant ecological areas and concluded with individual maps and descriptions for each. From an initial list of 115 sites, 62 areas met the criteria and were recommended for adoption by the study. In 1980, 61 of these biologically significant areas were adopted as part of the Conservation and Open Space Element of the Los Angeles County General Plan on the Special Management Areas Policy Map and through individual descriptions of the SEAs in Technical Supplement E of the 1980 General Plan.

In 1991, supplemental studies further assessing the biological resources within seven SEAs were conducted. The Phase I Studies, conducted by Michael Brandman Associates, assessed the following SEA areas: Cold Creek Significant Ecological Area No.9, San Fransciquito Canyon Significant Ecological Area No.19, Dudleya Densiflora Population Significant Ecological Area No.45, Kentucky Springs Significant Ecological Area No.61, Las Virgenes Significant Ecological Area No.6, Tonner Canyon and Chino Hills SEA No. 15, and Tuna Canyon SEA No. 10. The studies looked at current ownership patterns, existing resources, development pressures and made recommendations into the future management of the SEAs. All of the Phase I studies found either that the SEA boundaries were adequate in size or recommended the expansion of the boundaries to better encompass and protect biotic resources.

In 2000, the DRP commissioned the Los Angeles County Significant Ecological Area Update Study (2000 Update Study) prepared by PCR Services Corporation, Frank Hovore & Associates and Forma Systems. The 2000 Update Study included an Executive Summary, Background Report and twelve biological resources assessments for the Proposed Antelope Valley SEA, Proposed Cruzan Mesa Vernal Pools SEA, Proposed East San Gabriel Valley SEA, Proposed Joshua Tree Woodlands SEA, Proposed Puente Hills SEA, Proposed San Andreas SEA, Proposed San Dimas Canyon and San Antonio Wash SEA, Proposed San Gabriel Canyon SEA, Proposed Santa Catalina Island SEA, Proposed Santa Clara River SEA, Proposed Santa Monica Mountains SEA, and the Proposed Santa Susana Mountains and Simi Hills SEA. These twelve biological resource assessment areas consolidated the 1980 unincorporated area SEAs into larger areas for study and proposed inclusion as SEAs.

The 2000 Update Study also examined the assumptions of the original eight SEA designation criteria from the 1976 SEA Study, modifying one criterion and deleting two. The modification of Class 1 changed the language from "the habitat of rare, endangered, and threatened plant and animal

species," to specify "the habitat of *core populations* of rare, endangered and threatened plant and animal species." Class 6: "areas important as game species habitat or as fisheries" was removed due to the questionable contribution of these areas towards maintaining biotic diversity. Class 8: "special areas" was deleted due to the vague nature of that designation. The six SEA criteria are contained within this Appendix E, and each SEA description lists which criteria it meets.

From 2001 to 2011, the DRP conducted public outreach, solicited additionalrecommendations on the SEA boundaries and checked the SEA boundaries with an expert panel ofbiologists convened in 2010.

SEA Designation Principles

Previously, areas were assigned SEA designations in an attempt to slow or modify the type of development within their boundaries. However, as the County underwent a period of unanticipated growth, many of the SEAs experienced a reduction and/or degradation of their biotic diversity.Appendix E uses the definition of biotic or biological diversity provided by the 1990 U.S. Congressional Biodiversity Act, HR1268, which is defined as a full range of variety and variability within and among living organisms and the ecological complexes in which they occur.

Currently, the design of the SEAs is based on scientifically-grounded concepts regarding size and connectivity. Where feasible, SEAs form linkages between core habitats, which are large blocks of habitat generally conforming to a significant topographical feature, such as a watershed, major river, butte, etc., in order to ensure regional species movement.

Most SEA designations do not focus on a single resource or habitat type and, over time, conservation plans have come to employ a fluid approach to conserving an everincreasing list of sensitive resources (e.g., endangered species, habitats of limited distribution, and "patchy" habitats such as coastal sage scrub). The SEA designations rely on two primary conservation principles: namely that species extinction rates are lower on larger "islands," or blocks of land, than smaller islands; and that isolated habitat areas have less opportunity to regain species by re-colonization from other areas.

Many wildlife species, particularly carnivores and other wide ranging species, require large areas of suitable habitat for genetically and demographically viable populations. In addition, large islands are more likely to encompass diverse habitat types and are more easily buffered against potential impacts from surrounding developed lands. The SEAs are designed to provide habitat linkages between related habitat types (such as the Antelope Valley buttes, or the San Andreas Rift Zone wetlands),by encompassing areas of sufficient width to function as wildlife movement routes between these open space areas.

The current SEA designations provide local resources (such as sensitive species) and their habitats, as well as the seasonal support habitats for those resources, with connections to essential sustaining resource areas (such as corridor areas and hydrological systems). For example, zones of lower intensity human impacts that exist between essential habitat resources have been included in the current SEA designations, thereby helping to maintain the biotic diversity in the County. The designation of Coastal Resource Area (CRA) is given to those SEAs located with the California Coastal Zone.

SEA Selection Criteria

All of the County's SEAs and CRAs must satisfy at least one of the six SEA selection criteria:

A. The habitat of core populations of endangered or threatened plant or animal species.

Intent of Criterion A: These areas are important in maintaining viable plant and/or animal populations for those species recognized by state and or federal resource agencies as being extremely low in numbers or having a very limited amount of suitable habitat available. The terms "endangered" and "threatened" have precise meanings defined in both state and federal law. The identification of "core population"' will be determined by the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife~~Game~~ (CDFW~~G~~). The term "core population" as used here is a general biological term referring to a known and/or a viable population. Other locations of endangered or threatened plant or animal species may also occur in the County, which are not within an SEA. It should also be noted that the concept of core populations is consistent with current thinking of the USFWS and the CDFW~~G~~.

This criterion is not meant to constitute a recovery program for listed species, but one element of a more comprehensive conservation effort for the long term sustainment of listed species within the County. At the local level, recovery programs of both the CDFW~~G~~ and the USFWS have measures in place that can impose severe penalties for the "take"of listed species or their habitat.

- Federally Endangered: "any species which is in danger of extinction throughout all or a significant portion of its range...."

- Federally Threatened: "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

- State Endangered: "....a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease."

- State Threatened: "....a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter." [California Code of Regulations, Title 1, Sec 670.5]

B. On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.

Intent of Criterion B: The purpose of this criterion is to identify biotic resources that are uncommon on a regional basis. The geographical region considered could be as small as the Southern California coastal plains, the Transverse Mountain Ranges, the Mojave Desert, the Southern California coastline, etc. The geographical region could also be as large as Southern California, the Pacific coast, all of California, the western United States, or even larger. The community, association, or habitat is either unique or restricted in distribution in an area larger than the political boundaries of the County (i.e., coastal sage scrub, native grasslands, or vernal pools). Resources

that are limited in distribution in the region being considered, but common elsewhere, are also included under this category.

C. Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.

Intent of Criterion C: The purpose of this criterion is to identify biotic resources that are uncommon within the political boundaries of the County, regardless of their availability elsewhere. The County has a high diversity of biological components. The County and San Diego County are the only counties in the U.S. that possess coastal, montane, and desert subregions within their boundaries. It is a rich heritage that few local governments have an opportunity to preserve.

Many biotic communities that were once common in the County have been severely reduced due to urban and agricultural development. This is especially true south of the San Gabriel Mountains, and among the agricultural fields of the North County. Other biotic features have never been common.

D. Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, migrating grounds and is limited in availability either regionally or in the County.

Intent of Criterion D: Species or groups of species, at various points in their life cycles, tend to congregate in certain areas. These areas possess resources that are essential to the maintenance of specific wildlife species. This criterion is intended to identify those areas that are limited in distribution either regionally or in the County, and not the primary habitat of common species or groups of species.

E. Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.

Intent of Criterion E: Oftentimes scientists learn the most about a biological phenomenon by studying it at an extreme in its distribution. This frequently reveals the biological and ecological parameters under which it can survive. In addition, isolated populations and communities often are relicts of what was present in an area at some previous time, and may show genetic traits not found elsewhere in the species. These biological and ecological parameters may be useful in determining taxonomic relationships.

F. Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.

Intent of Criterion F: The intent of this criterion was to identify examples of the primary biotic resources in the County. At least one example (e.g., native grassland, valley oak savannah) of each vegetation type will be selected from the various geographical regions in the County in order to preserve basic biogeographic diversity.

SEA Descriptions

The following are detailed descriptions of each of the 21 SEAs. Descriptions of the nine CRAs follow these SEA descriptions.

Note regarding plant community classifications:

Plant communities within the SEAs were classified using standard methodology and terminology. The communities in this description correspond directly with those listed in Holland's *Preliminary Descriptions of the Terrestrial Natural Communities of California* (1986 and 1992 update). In recent years, ecologists have refined Holland's approach to define communities primarily by their constituent plant assemblages and have now widely adopted the classification system described by Sawyer, Keeler-Wolf and Evens in *A Manual of California Vegetation*, Second Edition 2009 (MCV). This has become the accepted standard recognized by the California Department of ~~Fish and Game~~Fish and Wildlife, the California Native Plant Society and the U.S. Fish and Wildlife Service.

The important difference between the two methods is that the earlier system's categories were based on a variety of factors, such as physiographic features, as in the case of vernal pools, or by specific plants, as in the case of coast live oak woodland, or by the use of commonly accepted terms, as in "chaparral." In the MCV, plant communities are defined with more precision as botanical alliances where one, occasionally two, particular plant species are dominant or co-dominant with a host of other possible associated plants. The MCV lists no one plant community called chaparral because in habitats of this type any one of a variety of shrubs can be dominant and influence the character of the vegetation. For example, in a location where chamise is predominant, the alliance is classified as an *Adenostoma fasciculatum* Shrubland Alliance, while close by greenbark ceanothus may emerge as the most common shrub and this is termed a *Ceanothus spinosis* Shrubland Alliance.

The transition to the new MCV format is ongoing. Not all alliances have been fully described, and new ones are still being recognized and extensive research is in progress to define every alliance in the new MCV plant communities' format. The more familiar nomenclatures will continue to be used for the SEA Program when appropriate.

An effort has been made to conform to this new format. Descriptions and general locations of each plant community as described in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs* appear below. The plant communities correspond to Holland's *Preliminary Descriptions of the Terrestrial Natural Communities of California.* Each was considered baseline information and evaluated for the potential presence of alliances as described in the MCV. Alliances whose profiles matched the given criteria are listed. In many cases only with further investigation can the presence of some alliances be confirmed. In addition, it should be noted that not all alliances are listed within the SEA descriptions, as many alliances have yet to be defined and new alliances are still being discovered. Where species' scientific names have been updated from those used in the MCV, these are given in brackets and follow nomenclature presented in *The Jepson Manual, 2nd Edition* (Baldwin *et al*. 2012).

Status Abbreviations:

- ABC: American Bird Conservancy Green List
- AFS: American Fisheries Society categories of risk: vulnerable, threatened, or endangered;
- AWL: Audubon Watchlist
- BCC: Fish and Wildlife Service Birds of Conservation Concern

- BLMS: Bureau of Land Management Sensitive Species
- CDF: California Department of Forestry and Fire Protection Sensitive Species
- FC: Federal Candidate species
- FE: Federally listed as Endangered
- FSS: USDA Forest Service Sensitive Species
- FT: Federally listed as Threatened
- FPD: Federally proposed for delisting
- FPE: Federally proposed for listing as Endangered
- FPT: Federally proposed for listing as Threatened
- LAA: Los Angeles Audubon list of Los Angeles County's Sensitive Bird Species
- RPR: Rare Plant Rank
- SC: National Marine Fisheries Service Species of Concern
- SCD: State candidate for delisting
- SCE: State candidate for listing as Endangered
- SCT:State candidate for listing as Threatened
- SE: State-listed as Endangered
- SSC: CDFWG Species of Special Concern;
- ST: State-listed as Threatened
- USBC: United States Bird Conservation Watch List
- WBWG: Western Bat Working Group: High, Medium and Low priority
- Xerces: Xerces Society Red List of Pollinators

Altadena Foothills and Arroyos SEA

Location

General

The Altadena Foothills and Arroyos Significant Ecological Area (SEA) is located in the westernmost portion of the San Gabriel Valley. This SEA includes incorporated and unincorporated areas. The

SEA represents the lower elevation/urban interface portions of Millard, Alzada, Chiquita, Las Flores, Rubio, and Eaton canyons from the urban edge, to undeveloped wildland areas of the lower elevations of the Angeles National Forest.

The SEA is located within the Mount Wilson and Pasadena United States Geological Survey (USGS) 7.5' California Quadrangles.

General Boundary and Resources Description

On the west side of the Altadena Foothills and Arroyos, the western and southwestern boundaries track along the urban-wildland interface in the undeveloped areas of the Arroyo Seco, Fern, and El Prieto canyons, and the boundary pulls back around a small area of development at the northern-eastern edge of La Cañada-Flintridge. A developed area northeast of the junction of Millard Canyon and El Prieto is excluded. The SEA designation includes the undeveloped portions of sub-watersheds of the Arroyo Seco, and also encompasses undeveloped parts of drainages, including Alzada and Chiquita, which flow into the Devils Gate Reservoir of the Arroyo Seco. The Arroyo Seco is within the Los Angeles River watershed. This SEA includes portions of the cities of Pasadena and La Cañada-Flintridge, the unincorporated community of Altadena, and the Angeles National Forest. The eastern side of the southern boundary encompasses undeveloped areas of the sub-watersheds of Las Flores, Rubio and Eaton canyons, which are tributary to the Rio Hondo and historically to the San Gabriel River. Much, but not all, of the Rio Hondo catchment is diverted via flood-control channels to the Los Angeles River. The southern boundary of the SEA is bordered by developed properties. The southern boundary moves east along the urban-wildland interface to include undeveloped parts of watersheds, which closely follow the perimeter of Devil's Gate Reservoir, in the Hahamongna Park in Pasadena. From Hahamongna Park, the SEA boundary continues east along the edge of development into the San Gabriel River watershed. The eastern border of the SEA is the eastern ridge of Eaton Canyon near the canyon mouth. A finger of the SEA extends downstream along Eaton Wash to include the Eaton Debris Basin and Reservoir. The northern boundary is formed along ridgelines within the Angeles National Forest that define the catchment of the local canyons. Within the Angeles National Forest, development is much less dense, in the form of in-holdings and Angeles National Forest leases, and is often naturally landscaped, albeit disturbed.

The chief attribute of this SEA is a high diversity of species, which is due to the SEA's position between the mountain biome and the valley biome, caused by an abrupt change of slope formed by the thrust fault complex that borders the San Gabriel Mountains. Furthermore, the SEA has as its center the dividing ridge between the two principal rivers of the Los Angeles Basin, the Los Angeles River and the San Gabriel River.

The wide range of elevation, topography, aspect, and geology represent a diverse array of physical habitats within this SEA. In general, the topography of the SEA is moderately steep to very steep, which results in a number of very narrow corridors with elevations ranging from a high of approximately 2,400 feet above mean sea level (MSL) to a low of approximately 1,200 feet above MSL. Consequently, a variety of plant communities exist, including riparian and upland shrublands and woodlands. Within these major community types, there are many vegetation series that varyaccording to plant species dominance.

Of particular note for this SEA is its potential to accommodate lower elevation east-west linkages. This is significant because of the constraints of development at lower elevations, the very steep terrain, and seasonal snow storms above the SEA, beginning at about 3000 feet—all of which limit

potential movement for many species. There is also potential for north-south wildlife movement between the Angeles National Forest and the Verdugo Mountains via the Arroyo Seco and the San Rafael Hills. The Arroyo Seco is the eastern limit of this link and creates a potential movement corridor from the Angeles National Forest, over and under the Interstate-210. Across the Interstate-210, the linkage enters the San Rafael Hills, where blocks of habitat remain in the cities. Some are conserved in natural open space, such as the Cherry Canyon Park and Open Space Preserve of the City of La Cañada-Flintridge, just south of the County Descanso Gardens. These open spaces are interspersed with residential development and are not part of the SEA. From the San Rafael Hills, linkage potential may be traced to the west across State Route-2 and Verdugo Wash, past enclaves of residential development to access the Verdugo Mountains.

Vegetation

The variety of topography, soil types, slope aspects and water availability within the SEA creates a range of physical habitats that support numerous communities. Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.* Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Brief descriptions and general locations of each major plant community present within the SEA are provided below, including oak woodland, white alder riparian woodland, chaparral, and coastal sage chaparral scrub.

Oak Woodland: A plant community dominated by arborescent species of the oak genus(*Quercus*). Within this SEA, oak woodlands are dominated by one of two species: coast live oak (*Quercus agrifolia* var. *agrifolia*) and canyon oak (*Q. chrysolepis*). Understory and adjacent vegetation varies from annual grasses and forbs in level areas to shrubs where topography is steeper. Coast live oak woodland often forms a closed canopy and is scattered throughout the SEA, but is most prevalent on north-facing slopes and in drainage bottoms. The canyon oak woodland canopy is typically more open and found on steep, north-facing canyon walls.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance
- *Quercus chrysolepis* (canyon oak woodland) Woodland Alliance

White Alder Riparian Woodland: Found along perennially-flowing streams in bedrock-constrained, steep-sided canyons, which result in a fairly narrow riparian corridor. This community is dominated by white alder (*Alnus rhombifolia*), which may grow 50 to 60 feet high over a shrubby understory.

Corresponding MCV community:

- *Alnus rhombifolia* (white alder groves) Forest Alliance

Chaparral: A shrub community comprised of robust, woody, mostly evergreen species. Within this SEA, a number of chaparral series are found according to their dominant plant species. These include chamise, laurel sumac (*Malosma laurina*), ceanothus (*Ceanothus spp.*), San Gabriel scrub oak (*Quercus dumosa* var. *gabrielensis*), and mosaics of these depending on mixtures of species

and elevation. These and other shrub species form dense vegetation 5 to 10 feet in height. The development of chaparral is pronounced over the hillside areas throughout the SEA.

Corresponding MCV communities:

- *Adenostoma fasciculatum* (chamise chaparral) Shrubland Alliance
- *Adenostoma fasciculatum-Salvia apiana* (chamise–white sage chaparral) Shrubland Alliance
- *Arctostaphylos glandulosa* (Eastwood's manzanita chaparral) Shrubland Alliance
- *Arctostaphylos glauca* (bigberry manzanita chaparral) Shrubland Alliance
- *Ceanothus leucodermis* (chaparral whitethorn) Shrubland Alliance
- *Ceanothus spinosus* (greenbark ceanothus chaparral) Shrubland Alliance
- *Ceanothus oliganthus* (hairy leaf ceanothus chaparral) Shrubland Alliance
- *Prunus ilicifolia* (holly leaf cherry chaparral) Shrubland Alliance
- *Rhus ovata* (sugarbush chaparral) Shrubland Alliance

Coastal Sage Scrub: A shrubland community exhibiting less robust structure that is found in this SEA. This plant community is dominated by summer-deciduous shrubs, such as California sagebrush (*Artemisia californica*), California brittle bush (*Encelia californica*), white sage (*Salvia apiana*), black sage (*S. mellifera*), and California buckwheat (*Eriogonum fasciculatum*). It also forms dense stands, which grow three to four feet in height. Within this SEA, it is generally found in scattered patches, which are highly integrated with mixed chaparral. This plant community is generally found on hotter, drier south-facing slopes, lower ridges and small flats, which are primarily located in the lower elevation hillsides of the SEA.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisiacalifornica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Dendromecon rigida* (bush poppy scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub) Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance

- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Eriogonum fasciculatum-Salvia apiana* (California buckwheat-white sage scrub)Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*] (deer weed scrub) Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub) Shrubland Alliance

Wildlife

Wildlife populations within the SEA are diverse due to the area's vegetative diversity and its location within and adjacent to the Angeles National Forest. The analysis of invertebrates is severely limited due to the lack of collection-related data; however, the SEA is likely to support healthy populations of a diverse assortment of invertebrate species based on its undisturbed nature and variety of habitats. Amphibians are present within the aquatic and semi-aquatic habitats along the Arroyo Seco, Millard Canyon, Eaton Canyon, and tributary drainages. Reptile abundance and diversity are characteristic of the habitats present, although areas closer to urban development along the southern boundaries of this SEA are likely to be degraded due to edge effects.

Bird use, diversity, and abundance within the SEA are high for several reasons. In general, this SEA provides habitat for a wide range of shrubland, woodland, and riparian species that occur at varying elevations. In particular, the riparian habitats found in drainages throughout this SEA provide essential habitat for riparian-obligate and riparian-favoring species. In addition, a number of migratory birds use this area to move across the northern portion of the Los Angeles Basin. These include a wide spectrum of birds including songbirds, waterfowl and raptors.

Similarly, the mammalian fauna is very diverse and abundant. Many mammalian species, including wide-ranging, large mammals, such as black bear, mountain lion, bobcat, coyote and deer are expected to use the SEA to forage. These animals are likely to den within the more isolated areas within the Angeles National Forest; however they are known to roam the SEA for foraging and dispersalopportunities.

Wildlife Movement

Wildlife movement within the SEA takes on two major forms. First, due to the extremely steep intervening topography, considerable movement of wildlife up and down the drainages, which course through this SEA to connect the forest interior with foothill areas, is expected. Consequently, this type of movement occurs on a seasonal basis, particularly for large mobile mammalsthat typically meet their full range of habitat needs over broad areas.

The second major type of movement occurs across the flanks of the foothills in an east-west direction. Particularly for riparian-obligate and riparian-favoring migratory birds, the corridor linking lower elevation riparian habitats in the SEA are of high importance and heavily utilized.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare. This is due to the species' declining or limited population sizes, which usually results from habitat loss. Watch lists of such resources are maintained by the California Department of Fish and WildlifeGame (CDFWG), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS). The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition.

Sensitive Plant Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of Fish and WildlifeGame (CDFWG) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.Sensitive communities include hairy leaf ceanothus chaparral, holly leaf cherry chaparral, chamise-white sage chaparral, California brittle bush scrub, white sage scrub, California buckwheat-white sage scrub, and oak riparian woodland. These communities, or closely related designations, are considered high priority communities by the CDFGCDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*) RPR 2.2
- San Gabriel manzanita (*Arctostaphylos glandulosa* ssp. *gabrielensis*) RPR 1B.2
- Braunton's milk-vetch (*Astragalus brauntonii*) RPR 1B.1, FE
- Nevin's barberry (*Berberis nevinii*) RPR 1B.1, SE, FE
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*) RPR 1B.1
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*) RPR 1B.1
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*) RPR 2.2
- San Gabriel oak (*Quercus dumosa* var. *gabrielensis*) RPR 4.2
- Greata's aster (*Symphyotrichum greatae*) RPR 1B.3
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*) RPR 1B.2

- Plummer's mariposa lily (*Calochortus plummerae*) RPR 1B.2
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*) RPR 1B.1

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Coast range newt (*Taricha torosa*) SSC
- Western pond turtle (*Emys marmorata*) BLMS, SSC, FSS
- Silvery legless lizard (*Anniella pulchra pulchra*) SSC, FSS
- Coast horned lizard (*Phrynosoma blainvillii*) BLMS, SSC, FSS
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*) ~~CDFG~~CDFW Special Animals List
- Coastal rosy boa (*Lichanura trivirgata roseofusca*) FSS
- San Bernardino mountain kingsnake (*Lampropeltis zonata parvirubra*) SSC, FSS
- Coast patch-nosed snake (*Salvadora hexalepis virgultea*) SSC
- San Bernardino ringneck snake (*Diadophis punctatus modestus*) FSS
- Two-striped garter snake (*Thamnophis hammondii*) BLMS, SSC, FSS
- American peregrine falcon (*Falco peregrinus anatum*) FD, SD, CDF, ~~CDFG~~CDFW Fully Protected, BCC
- Southwestern willow flycatcher (*Empidonax traillii extimus*) FE, SE, ABC
- Least Bell's vireo (*Vireo bellii pusillus*) FE, SE, ABC
- Coastal California gnatcatcher (*Polioptila californica californica*) FT, ABC, SSC
- American badger (*Taxidea taxus*) SSC
- Western mastiff bat (*Eumops perotis californicus*) BLMS, SSC, WBWG High Priority
- Big free-tailed bat (*Nyctinomops macrotis*) SSC, WBWG: Medium-High Priority
- Pallid bat (*Antrozous pallidus*) BLMS, SSC, FSS, WBWG: High Priority
- Silver-haired bat (*Lasionycteris noctivagans*) ~~CDFG~~CDFW Special Animals List, WBWG Medium Priority
- Hoary bat (*Lasiurus cinereus*) ~~CDFG~~CDFW Special Animals List, WBWG: Medium Priority

- Western yellow bat (*Lasiurus xanthinus*) SSC, WBWG: High Priority
- San Diego desert woodrat (*Neotoma lepida intermedia*) SSC

Regional Biological Value

The SEA meets important SEA designation criteria and supports many regional biological values. Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE ALTADENA FOOTHILLS AND ARROYOS SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Not Met	None within this SEA.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The SEA is designating one of the principle ecotones of the Southern California coastal areas: the area where the sediment of the coastal alluvial fans from the mountain streams and drainages is exiting the abrupt upthrust rock of the mountains. Here one finds the biotic communities of the mountains meeting the communities of the coastal plain areas, combining with the organisms that are only found at the junction. The natural habitats of this kind of biological area are fast dwindling as urban communities expand to the limits of easily buildable space.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The SEA is designating one of the principle ecotone areas of the County coastal exposure: the area where the sediment of the alluvial fans from the mountain streams and drainages is adding to the mile-deep sediments of the Los Angeles Basin, as the watercourses exit the abrupt upthrust rock of the San Gabriel Mountains. It is an area where one can often encounter flora that is characteristic of the Peninsular Ranges to the south and flora of the coastal ranges and Sierra Nevada to the north, among typical flora of the Transverse Ranges. The SEA contains prime examples of coastal sage scrub and other kinds of chaparral, riparian oaks, woodlands of the canyon oak of the mountains, woodlands of the coast live oak, which occurs both in the lower mountains and the valleys, good stands of the San Gabriel endemic oak (*Quercus dumosa* var. *gabrielensis*), diverse and beautiful flora characteristic of the continually changing beds of the mountain streams, both perennial and intermittent, and the wildlife that reside in these various habitats.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated	Met	The SEA provides a low-elevation constrained corridor. The SEA serves as the only corridor to provide interacting component habitat areas for species to feed, rest, and migrate

Criterion		Status	Justification
	breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.		from low basin and foothill elevations to the sub-alpine elevations of the high San Gabriel Mountains.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Not met	None within this SEA.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Areas encompassed within the SEA represent the only remaining stands of low-elevation foothill scrub, chaparral, and canyon woodland communities within the north San Gabriel Valley. These communities once extended throughout what are now the communities of the north San Gabriel Valley, bridging the transition between high chaparral on the southern slope of the San Gabriel Mountains to the alluvial fans extending beneath the mountains to the coastal basin.

In conclusion, the area is an SEA because it contains (B-C) a good example of the biotic communities typical of the area where the abrupt upthrust of the mountains meets the alluvial fans of the valleys, a natural habitat that is limited in availability in the County and the coastal Southern California region; (D) it has a constrained connective corridor area near the Devil's Gate Dam where the freeway underpasses provide access between the San Rafael Hills and the San Gabriel Mountains; and (F) it supports intact remant stands of low-elevation chaparral and scrub communities that were once more widespread within the region.

Antelope Valley SEA

Location

General

The Antelope Valley Significant Ecological Area (SEA) is located in the central portion of the Antelope Valley, primarily east of the cities of Palmdale and Lancaster, within a predominantly unincorporated area of the County. The SEA is focused on the principal watercourses of the area: Little Rock Creek and Big Rock Creek and tributaries, such as Mescal Creek. The California Audubon recognizes the area of Edwards Air Force Base as a Globally Important Bird Area (IBA), which is visited by tens of thousands of migrant birds during the spring and fall migratory seasons, and supportsthe breeding of rare and endangered birds during the spring and summer months.

The SEA is located, at least partially, in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles: Rosamond, Rosamond Lake, Redman, Rogers Lake S, Jackrabbit Hill, Lancaster E, Alpine Butte, Hi Vista, Adobe Mountain, Palmdale, Littlerock, Lovejoy Butte, El Mirage, Pacifico Mountain, Juniper Hills, Valyermo, and Mescal Creek.

General Boundary and Resources Description

Watercourses and water features, such as dry lakes and springs, are the focus for desert life and central to connectivity and biodiversity in this region. The SEA was delineated to emphasize the importance of the Little Rock Creek and Big Rock Creek watersheds to the surface and subsurface hydrology of the Antelope Valley and to the dry lakes. The western portion of the SEA extends along the margin of Little Rock Creek Wash and floodplain zone, while the eastern margin follows a tributary of Big Rock Creek, which is Mescal Creek Wash and its tributaries. The origins of the watercourses in the Angeles National Forest are an important aspect of their diversity and connectivity, and the importance of the diverse forest vegetation of this SEA is discussed below. The SEA includes several major buttes and numerous minor ones, which have highly diverse biota along with diverse desert habitats, which range from sand dunes formed from the wind-blown dust that the buttes collect, to rocky crags, which are home to various raptors. The SEA includes the County's portion of the watershed basin for dry lakes, which are the destination for the watercourses. There are three dry lakes and their adjacent plains (protected as part of Edwards Air Force Base) included in the SEA: Rosamond Dry Lake with the adjacent Piute Ponds, Buckhorn Lake, and Rogers Lake. These lakes and ponds are often flooded during the rainy winter-spring seasons, and are the principal resting areas on the Pacific Flyway. The northeastern portion of the SEA encompasses some agricultural cropland (portions of which are fallow) and dispersed rural residential uses;however, the underlying hydrology of the washes remains intact throughout the entire SEA.

Three main watercourse segments originate in the San Gabriel Mountains and flow through the Antelope Valley to dry lakes near the northern County boundary: 1) Little Rock Creek; 2) Big Rock Creek; and 3) Desert-Montane. Desert-Montane centers on Mescal Creek and includes adjacent drainages. The flows of all three drainages are subsurface for much of the year and may be on the surface during rain and snowmelt.

The Little Rock Creek segment (the westernmost segment), goes north from Little Rock-Palmdale Dam as its southern barrier. Upstream from the reservoir is critical habitat for the endangered arroyo toad (*Anaxyrus californicus* FE, SSC). The toad could occur from time to time in the downstream area of the SEA. Heading north to Mount Emma Road, the boundaries follow the flood zone of the Little Rock Creek Wash and also incorporate some of the vegetated slopes that drain to the wash. North from Mount Emma Road, the boundaries follow Federal Emergency Management Agency (FEMA) boundaries except where the braiding is clearly outside of the FEMA boundary, such as near Avenue U, between Avenue S and Avenue T, and north of Avenue Q. In these areas, the line follows the edge of the braiding. North of Avenue M, the lines follow FEMA boundaries to Avenue F. On the west side, just south of Edwards Air Force Base, the SEA boundary heads west to incorporate the conservation area identified by the West Mojave (WEMO) Plan for alkali mariposa lily. North of Avenue F, the eastern boundary follows the FEMA boundary to the Edwards Air Force Base boundary.

All of Edwards Air Force Base that is in the County is included in the SEA because the restricted entry and use protect the dry lakes and their neighboring areas. Many desert plants and wildlife species once found broadly across the Antelope Valley are now found only or primarilywithin Edwards Air Force Base. The ponds and dry lakes have distributed habitat of marshy alkali grassland, alkali flats, and cattail and bulrush marsh augmented by wastewater treatment facilities that have additional ponds. Some of the nesting rare and uncommon birds include white-faced ibis (*Plegadis chihi*), tricolored blackbird (*Agelaius tricolor*), redhead (*Aythya americana*), gadwall (*Anas*

strepera), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), least bittern (*Ixobrychus exilis*), and federally-threatened western snowy plover (*Charadrius alexandrinus nivosus*).

The Big Rock Creek area has western and eastern segments in the SEA. The western segment of the the SEA begins near the northern boundary inside the Angeles National Forest and heads north through and out of the Angeles National Forest along Pallett Creek. The SEA includes parts of Cruthers and Holmes creeks near their junctions with Pallett Creek. SEA boundaries follow the braided stream channel toward the confluence with Big Rock Creek. From the aqueduct at Big Rock Creek to Edwards Air Force Base, the western boundary line follows the FEMA boundaries along the western side of Big Rock Creek braids, including Alpine Butte, and joining to the Little Rock Creek segment along Edwards Air Force Base. On the east segment of Big Rock Creek, the SEA boundaries head north from the Angeles National Forest headwaters of Dorr Canyon (a Big Rock Creek tributary) and the headwater area of Big Rock Creek near State Route-2. The boundaries travel through the Angeles National Forest and follow the wash area of the streams toward the confluence with Pallett Creek. The Angeles National Forest floodplain of the widened area of South Fork of Big Rock Creek is included in the SEA.

South Fork of Big Rock Creek is part of the federally-designated critical habitat of the mountain yellow-legged frog (*Rana muscosa*, FE, SE). This frog is known in the County from only a few high-mountain streams in the San Gabriel Mountains. Climate change and other global factors, such as air pollution, are suspected to be responsible for its endangered status.

Another broad area of the San Andreas Fault Zone near the Valyermo Ranch follows the FEMA boundaries and includes a nesting area for gray vireos near Bobs Gap. Between the Angeles National Forest and the aqueduct, the SEA boundaries follow FEMA boundaries. The eastern boundary follows the FEMA boundary along the main course of Big Rock Creek to the vicinity of Avenue Q East, where it diverges to include sections that have the main area of Lovejoy Buttes. At Avenue O, the eastern boundary returns to the FEMA boundary, and continues northeastward along the FEMA boundary to skirt development in Lake Los Angeles. In the vicinity of Avenue M, the eastern boundary goes eastward through areas of natural vegetation (from about 100thStreet to 215thStreet) to include Rocky, Piute, and Saddleback buttes, and connect with the Desert-Montane transect segment.

The southern side branch of the Desert-Montane transect starts in the Angeles National Forest along the ridge of Table Mountain at the San Bernardino-Los Angeles County line. Table Mountain is known for its diverse flora, which includes desert and mountain elements, and some unusual limestone-obligate species. The SEA southern boundary along the ridgelinegradually becomes the western boundary as it skirts the camp developments along the southern base of Table Mountain. The boundary turns north along the western ridge of the Mescal Creek drainage, crossing the California Aqueduct with the State Route-138. The Mescal Creek flora is known to be highly diverse, and the SEA boundaries include much of the Inface Bluff on the west side of Mescal Creek, which adds further diversity to Mescal Creek habitats. From the aqueduct to Avenue R, the western boundary buffers the westernmost desert drainage by 200 feet, which protects the braided area of the watercourse. This part of the SEA includes Black Butte and the Three Sisters (buttes), many smaller unnamed buttes, as well as Mescal and Theodore Payne County wildlife sanctuaries. The east side of the transect is the San Bernardino-Los Angeles County line. At about Avenue U East, the eastern boundary veers off the San Bernardino-Los Angeles County line to the north-northwest, buffering the Puzzle Creek watercourse by about 200 feet, which protects the braiding of the

easternmost drainages. Near Avenue R, the boundary trends north, and goes north-northwest near Avenue P to include Moody Butte, lesser unnamed rises, and Blue Rock Butte.

The Desert-Montane segment largely avoids drainages that flow into and out of the Lake Los Angeles community, but the transect includes diffuse watercourses on the south side of Saddleback Butte, Saddleback Butte and the surrounding Saddleback Butte State Park, the Antelope Valley Indian Museum State Park at the base of Piute Butte, and Piute Butte. At about Avenue H and 70th Street East, the boundary turns to the northeast following natural vegetation to the County boundary near Avenue C. Here the boundary turns north along the line to where San Bernardino, Kern and Los Angeles counties meet. This northeastern part of the SEA has WEMO conservation areas for the threatened desert tortoise and state-threatened Mojave ground squirrel. The northeastern area has some BLM land and the County Phacelia Wildlife Sanctuary, which is also County Wildflower Preserve A. The SEA includes large parts of County Wildflower Preserve F.

On Edwards Air Force Base, north to south between Avenues B and E East, and west to east between 140th Street East and the San Bernardino-Los Angeles County line, there is federally-designated critical habitat for the state and federally-threatened desert tortoise (*Gopherus agassizii*). At 190th Street, the critical habitat widens to extend north beyond the County and the SEA into Kern County. At 200th Street, the critical habitat widens to the south to extend to Avenue H and then goes east across the San Bernardino-Los Angeles County line. The desert tortoise critical habitat area on Edwards Air Force Base is included in the SEA, and much of the SEA area north of Avenue H in the eastern drainages of the SEA is designated critical habitat for the tortoise.

The SEA traverses the Antelope Valley from the foothills of the San Gabriel Mountains, to the low elevations of the dry lake basins, and its expanse and considerable topographical relief is reflected in its relatively high floral and faunal diversity. The SEA includes playa lake, alkali marsh, alluvial fan scrub, a mosaic of xeric desert scrubs, Joshua tree woodland, desert riparian woodlands, juniper scrub, pinyon pine, chaparral and mixed conifer, oak, and riparian communities of higher elevations. Transitional zones (ecotones) between these communities often contain unusual species compositions, such as pinyon pine, juniper and Joshua trees together, or Joshua trees adjacent to cottonwood forest.

Edwards Air Force Base has the only good stands of mesquite (*Prosopis glandulosa*) remaining in the County. It has areas of Mojave spineflower (Chorizanthe spinosa), creosote bush scrub, alkali sink, and the transition vegetation between the two. Rosamond Lake has the best example of the shadscale scrub and alkali sink biotic communities in the County. Shadscale scrub needs heavy soil with underlying hardpan between 3000-6000 feet elevation, which is unusual in the County, and more common in the north Mojave Desert and Owens Valley. In addition, the playa has the southernmost extension of the Great Basin kangaroo rat (*Dipodomys microps*), which is an isolated geographic population of scientific interest.

The southernmost portions of the three “legs” of the SEA lie within the Angeles National Forest, and include the upper tributary watersheds and streams for Little Rock, Big Rock, and Mescal creeks. These areas support the mixed conifer, which are multi-species oak woodlands that are common to the middle-elevation zones on the north face of the San Gabriel Mountains. The creeks are higher energy systems at those elevations, as they collect water from the surrounding terrain, and are typically lined with woodlands of alder, willow, sycamore and cottonwood, with varying densities and with various compositions of species.

As the creeks drop north of the pressure ridges of the San Andreas Fault Zone, they lose gradient and widen, and most of the flow is beneath the surface, except during high energy storms or in the spring (depending upon rainfall totals in the watersheds). The vegetation becomes sparser and less evenly distributed along the channel margins. Crossing the lowlands of the Antelope Valley, the channels support a variety of desert scrub vegetation within the alluvial plains. Where the alluvial plains are wide and shallow, cottonwood-willow woodland and sycamore woodland vegetation communities often occur within the overall floodplain on stable terraces; around oxbow flow zones in the Antelope Valley; or where the groundwater table is replaced or augmented by agricultural runoff. The surrounding upland habitats are primarily desert scrubs, including creosote and chenopod scrubs, sand sheets (chiefly around the buttes), and Joshua tree woodland. Intact Joshua tree woodland, with native substrates present, supports a relatively high diversity of annual wildflowers, reptiles and mammals. The Joshua trees also provide nest sites for many desert and migratory bird species.

Lovejoy, Alpine, Piute, Black and Saddleback buttes, along with other, smaller unnamed buttes, form most of the topographical relief within the SEA. These areas offer different ecological conditions that are associated with rock shelter, perching sites, nesting sites, denning areas, wind protection and sand sheet accumulation areas. Local and migratory bat species roost and reproduce in the caves and crevices of the butte formations. The higher buttes provide the only local nesting sites for owls and other birds of prey.

Alpine Butte is the least disturbed butte in the County, with excellent stands of Joshua tree woodland and creosote bush scrub, and impressive wildflower displays when rainfall creates appropriate conditions. Lovejoy Butte has Joshua tree woodland and creosote bush scrub, with a central wind-blown sand community for a good mixture of rock and sand habitats. In addition, the close proximity of Lovejoy Butte to Big Rock Creek Wash increases the diversity of habitats in the area. It also suffers from impact from theLake Los Angeles community, which borders the butte on three sides. The clustering of buttes in the SEA may be important to the abundant, diverse wildlife that inhabits the various vegetation communities around and in the buttes. Saddleback Butte and Piute Butte together are protected as a state park, but Saddleback Butte is also subject to development for campsites and hiking trails. Piute Butte has a prehistoric site that may protect it from much future recreational development. All of the buttes harbor diverse wildlife and flora. Most of them are critical habitat for the state and federally-threatened desert tortoise. Some buttes within the desert tortoise's critical habitat are not included in the SEA.

The acitive and fallow open agricultural lands support a diversity of wildlife species, which essentially regard the fields and ditches as irrigated desert. Birds of prey frequently hunt over the open agricultural areas, including fallow fields; wide-ranging predators also find excellent hunting conditions in and around agricultural areas. A spectrum of local and migratory bat species feed over the irrigated fields in the spring and summer, when insect numbers are the highest, and at least one sensitive bat species, the pallid bat, forages in open scrub or ruderal desert habitats.

The northern portion of the SEA contains several unique habitat types, including mesquite bosque (threatened locally by lowering water tables and harvest for firewood), clay pan pools, vernal pools, alkali grasslands, alkali and freshwater marshes, and permanent ponds. Hundreds of bird species have been recorded from the pond and marsh habitats around the dry lakes and ponds, and numerous species nest on the playa margins or in the associated riparian habitats. The open creosote scrub and other xeric habitats on the slopes surrounding the lake playas serve as important

wintering areas for many raptor species, as well as large numbers of songbirds.

Vegetation

Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.* Sensitive plant species occurring or potentially occurring within the SEAs are discussed in the Sensitive Biological Resources section.

Desert Scrub: A comprehensive term for a number of relatively low-stature, sparse-cover communities of shrubs and sub-shrubs that commonly occur on open, sandy soils where groundwater is inaccessible, except to a few deep-rooted species. Dominants include Great Basin sagebrush, antelope bush, creosote bush, several species of *Atriplex* (saltbush), rabbitbrush, cheesebush, sages, winterfat, and burrobrush, which are often with one or more perennial grasses (needlegrasses, sand drop-seed) interspersed. Formations dominated by saltbushes and other related taxa, which may be particularly common on alkaline soils, are sometimes called chenopod scrubs, in reference to the family *Chenopodiaceae*, which includes most of the dominant species. Within the SEA, variations on this community often intergrade with, or form understory within, juniper woodland and Joshua tree woodland. Variations are also found on lower slopes, around the buttes and on the adjacent Antelope Valley floor. These formations also occur extensively within the Desert-Montane transect segment of the SEA.

Corresponding MCV communities:

- *Krascheninnikovia lanata* (winterfat scrubland) Shrubland Alliance
- *Suaeda moquinii* ([*Suaeda nigra*] bush seepweed scrub) Shrubland Alliance
- *Atriplex spinifera* (spinescale scrub) Shrubland Alliance
- *Pluchea sericea* (arrow weed thickets) Shrubland Alliance
- *Artemisia tridentata* (big sagebrush) Shrubland Alliance
- *Artemisia tridentata* ssp. *vaseyana* (mountain big sagebrush) Shrubland Alliance
- *Atriplex canescens* (fourwing saltbush scrub) Shrubland Alliance
- *Atriplex confertifolia* (shadscale scrub) Shrubland Alliance
- *Atriplex hymenelytra* (desert holly scrub) Shrubland Alliance
- *Atriplex lentiformis* (quailbush scrub) Shrubland Alliance
- *Acacia greggii* (catclaw acacia thorn scrub) Shrubland Alliance
- *Ericameria paniculata* (black-stem rabbitbrush scrub) Shrubland Alliance
- *Ambrosia salsola* (cheesebrush scrub) Shrubland Alliance

- *Baccharis salicifolia* (mulefat thickets) Shrubland Alliance
- *Larrea tridentata* (creosote bush scrub) Shrubland Alliance
- *Larrea tridentata-Ambrosia dumosa* (creosote bush-white burr sage scrub) Shrubland Alliance
- *Atriplex polycarpa* (allscale scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub)Shrubland Alliance
- *Eriogonum heermannii* (Heermann's buckwheat patches) Provisional Shrubland Alliance
- *Eriogonum wrightii* (Wright's buckwheat patches)Dwarf Shrubland Alliance
- *Ephedra californica* (California joint fir scrub) Shrubland Alliance
- *Allenrolfea occidentalis* (iodine bush scrub) Shrubland Alliance
- *Sarcobatus vermiculatus* ([*Sarcobatus baileyi*] greasewood scrub) Shrubland Alliance
- *Yucca brevifolia* (Joshua tree woodland) Woodland Alliance
- *Prosopis glandulosa* (mesquite bosque) Woodland Alliance
- *Ambrosia salsola* (cheesebush scrub) Shrubland Alliance
- *Grayia spinosa* (spiny hop sage scrub) Shrubland Alliance
- *Castela emoryi* (crucifixion thorn stands) Shrubland Special Stands
- *Ericameria nauseosa* (rubber rabbitbrush scrub) Shrubland Alliance
- *Gutierrezia sarothrae* (broom snake weed scrub) Provisional Shrubland Alliance
- *Ambrosia dumosa* (white bursage scrub) Shrubland Alliance
- *Eriogonum fasciculatum-Salvia apiana* (California buckwheat-white sage scrub) Shrubland Alliance
- *Lepidospartum squamatum* (scale broom scrub) Shrubland Alliance
- *Purshia tridentata* (bitter bush scrub) Shrubland Alliance
- *Artemisia californnica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub) Shrubland Alliance

Chaparral: Consists of broad-leafed or needle-leafed, sclerophyllous (hard-leafed), medium height to

tall shrubs that form a dense cover on steep slopes that are usually below 5,000 feet in Southern California. Dominant species found within this community include scrub oaks (several species), chamise, manzanita, wild lilac, toyon, and western mountain-mahogany. This plant community occupies internal slopes, particularly on north-facing exposures, within the higher elevations of the SEA.Shrubs are frequently interspersed as understory formations within oak and conifer woodlands.

Corresponding MCV communities:

- *Adenostoma fasciculatum* (chamise chaparral)Shrubland Alliance
- *Adenostoma fasciculatum-Salvia apiana* (chamise-white sage chaparral) Shrubland Alliance
- *Adenostoma fasciculatum-Salvia mellifera* (chamise-black sage chaparral)Shrubland Alliance
- *Arctostaphylos glandulosa* (Eastwood's manzanita chaparral) Shrubland Alliance
- *Arctostaphylos glauca (*bigberry manzanita chaparral) Shrubland Alliance
- *Ceanothus cuneatus* (wedge leaf ceanothus chaparral, buck brush chaparral)Shrubland Alliance
- *Ceanothus greggii* (cup leaf ceanothus chaparral) Shrubland Alliance
- *Ceanothus crassifolius* (hoary leaf ceanothus chaparral) Shrubland Alliance
- *Lotus scoparius* ([*Acmispon glaber*] deer weed scrub) Shrubland Alliance
- *Prunus ilicifolia* (hollyleaf cherry chaparral) Shrubland Alliance
- *Prunus emarginata* (bitter cherry thicket)Provisional Shrubland Alliance
- *Rhus ovata* (sugarbush chaparral) Shrubland Alliance

Grassland Communities:Consist of low, herbaceous vegetation that is dominated by grasses. This community also harbors native forbs and bulbs, as well as naturalized annual forbs. Only fragmentary representatives of native grasslands exist within the SEA, with mostly sand drop-seed colonies on relatively less-disturbed sandy substrates around the buttes. Non-native grassland consists of dominant invasive annual grasses that are primarily of Mediterranean origin. Dominant species within this “community,” which is a ruderal formation and not a true habitat or community, include oats, bromes, foxtail chess and other grasses, wild mustards and other disturbance-favored “weedy” taxa. Non-native grasslands and other ruderal formations occur in small patches throughout the SEA and cover much of the land left fallow from agriculture.

Corresponding MCV communities:

- *Avena (barbata, fatua)* (wild oats grasslands) Semi-Natural Herbaceous Stands
- *Brassica (nigra)* and other mustards (upland mustards) Semi-Natural Herbaceous Stands

- *Bromus (diandrus, hordeaceus)-Brachypodium distachyon* (annual brome grasslands)Semi-Natural Herbaceous Stands

- *Bromus rubens-Schismus (arabicus, barbatus)* ([*Bromus madritensis* ssp. *rubens*] red brome or Mediterranean grass grasslands)Semi-Natural Herbaceous Stands

- *Centaurea (solstitialis, melitensis)* (yellow star-thistle fields) Semi-Natural Herbaceous Stands

- *Lolium perenne* ([*Festuca perennis*] perennial rye grass fields) Semi-Natural Herbaceous Stands

Wildflower Field:An amorphous mix of herbaceous plants noted for conspicuous annual wildflower displays, although noteworthy displays do not occur every year and appear to depend on rainfall patterns. Dominance varies from site to site and from year to year at any one particular site. Species frequently present include California poppy, tidy tips, dove lupine, valley tassels, purple owl's clover, and broad-leaved gilia. Within the SEA, prominent wildflower fields occur on the south facing slopes of the Tehachapi Mountains and the buttes.

Corresponding MCV communities:

None at this time.

Southern Willow Scrub:A riparian community consisting of dense, broad-leafed, winter-deciduous riparian thickets that occur within and adjacent to seasonal or permanent watercourses. The "scrub" habitat is generally sub-mature, which is a state that is often maintained by frequent heavy over-flooding–and may attain woodland or forest stature if undisturbed for several decades. Dominant species of this community within the SEA are mulefat, sandbar and arroyo willow. Within the SEA this community primarily occurs along portions of the tributary drainages to Little Rock and Big Rock creeks, but elements of it also may occur around the periphery of ponds and marshes.

Corresponding MCV communities:

- *Salix exigua* (sandbar willow thickets) Shrubland Alliance

- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance

Joshua Tree Woodland:Dominated by Joshua tree, which usually is the only arborescent species, and with numerous smaller shrub species interspersed. Shrub species commonly associated with Joshua tree woodland habitat include creosote bush, Great Basin sagebrush, California buckwheat, saltbush, horsebrush, desert almond, and antelope bush. Joshua tree woodland is present in varying densities and age formations over much of the less-disturbed uplands around the two primary washes, and throughout the Desert-Montane transect.

Corresponding MCV communities:

- *Yucca brevifolia* (Joshua tree woodland) Woodland Alliance

Juniper Woodland:An open formation dominated by California juniper, often with an understory of desert scrub species, and sometimes mixed with chaparral or Joshua tree woodland at middle

elevations. This community is found on lower slopes in the San Andreas Fault Zone.

Corresponding MCV communities:

- *Juniperus californica* (California juniper wooddland) Woodland Alliance
- *Juniperus grandis* (mountain juniper woodland) Woodland Alliance
- *Juniperus osteosperma* (Utah juniper woodland) Woodland Alliance

Mixed Conifer-Oak Woodland Formations:Typically consist ofan overstory of oaks (canyon, interior live) intermixed with bigcone Douglas fir, incense cedar, and yellow pine of varying densities and compositions, depending on slope orientation, substrates, and fire history. Understory vegetation is usually dominated by chaparral species, such as scrub oak, manzanita, and wild lilac. This community occurs only in canyons in the higher elevations of the SEA.

Corresponding MCV communities:

- *Quercus chrysolepis* (canyon live oak forest) Forest Alliance
- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance
- *Quercus wislizenii* (interior live oak woodland) Woodland Alliance
- *Pinus coulteri* (Coulter pine woodland) Woodland Alliance
- *Pseudotsuga macrocarpa-Quercus chrysolepis* (bigcone Douglas-fir forest) Forest Alliance

Southern Cottonwood-Willow Riparian Forest:A broad-leafed winter-deciduous habitat that is dominated by Fremont cottonwood, in places mixed with willow or western sycamore. Southern cottonwood-willow riparian forest (or woodland) occurs within the SEA along segments of Little Rock Creek and Big Rock Creek, and rows of trees line the periphery of irrigated sites, lakes and ponds.

Corresponding MCV communities:

- *Populus fremontii* (Fremont cottonwood forest) Forest Alliance
- *Populus trichocarpa* (black cottonwood forest) Forest Alliance

Mesquite Bosque:Consists of dense thickets of mesquite trees, usually found where groundwater resources are sufficient in quantity and depth to support the trees. There are remnant patches of this habitat throughout the northern portion of the SEA, but most of the trees have declined or died as water tables have been drawn down and mesquite wood has been harvested. Several large, healthy stands of this habitat persist around the southern perimeter of the dry lakes.

Corresponding MCV communities:

- *Prosopis glandulosa* (mesquite bosque, mesquite thicket) Woodland Alliance

Freshwater Marsh:Develops in areas of still or slow-moving permanent freshwater. This community

is dominated by the perennial, emergent cattail, which may reach heights of seven feet and grow in densities that form a closed canopy. Bulrush may also occur or be dominant within freshwater marsh. This formation occurs in scattered ponds and irrigation ditches throughout most of the SEA, but does form large, natural habitat areas at Piute Ponds and other pond sites around the dry lakes.

Corresponding MCV communities:

- *Phragmites australis* (common reed marshes) HerbaceousAlliance and Semi-Natural Stands
- *Schoenoplectus americanus* (American bulrush marsh) Herbaceous Alliance
- *Schoenoplectus californicus* (California bulrush marsh) Herbaceous Alliance
- *Typha (angustifolia, domingensis, latifolia)* (cattail marshes) Herbaceous Alliance
- *Lemna (minor)* and relatives (duckweed blooms) Provisional Herbaceous Alliance

Alkali Marsh:Similar to the freshwater marsh described above, but with more salt-tolerant plant species present. Species associated with this community include cattail, saltgrass and common reed. Alkali marsh occurs in small segments along Amargosa Creek, Edwards and Piute ponds, and other wetland areas scattered along the San Andreas Fault Zone.

Corresponding MCV communities:

- *Sarcobatus vermiculatus* ([*Sarcobatus baileyi*] greasewood scrub) Shrubland Alliance
- *Schoenoplectus americanus* (American bulrush marsh) Herbaceous Alliance
- Sporobolus airoides (alkali cordgrass marsh) Herbaceous Alliance
- *Allenrolfea occidentalis* (iodine bush scrub) Shrubland Alliance
- Atriplex lentiformis (quailbush scrub) Shrubland Alliance
- *Suaeda moquinii* ([*Suaeda nigra*] bush seepweed scrub) Shrubland Alliance

Desert Alluvial Wash and Alluvial Fan Scrub: Generally consist of a mixture of shrubs, which colonize and persist within infrequently scoured and flooded terrain such as floodplains, alluvial plains, or along seasonal streams. It is sometimes known as floodplain sage scrub. The dominant shrub in most washes is scalebroom, but Great Basin sagebrush, rabbitbrush, sweetbush, and chaparral yucca also may occur in the habitat type. This vegetation type is common throughout the alluvial plains and washes in the SEA.

Corresponding MCV communities:

- *Lepidospartum squamatum* (scale broom scrub) Shrubland Alliance

Disturbed or Barren Areas:These are areas thateither completely lack vegetation or are dominated by ruderal species. Ruderal vegetation typically found within the SEA includes non-native grasses

and “weedy” herbaceous species, native and non-native, including doveweed, mustards, telegraph weed, Russian thistle, dock, yellow star thistle, tocalote, Australian saltbush, and cocklebur. Disturbed areas occur throughout the SEA on fallow agricultural sites, around active agriculture and residential developments, along paved roads, fire breaks, dirt access roads, trails, and other similarly disturbed areas.

Corresponding MCV Communities:

None at this time.

Wildlife

Wildlife within the SEA is moderately diverse and abundant, commensurate with the extensive acreage of natural open space and the relative diversity of habitat types. While a few wildlife species are entirely dependent upon a single vegetative community, the entire mosaic of vegetation communities within the SEA and adjoining areas constitutes a continuum of functional ecosystems supporting a wide variety of wildlife species, both within the SEA boundaries and as a part of the regional ecosystem.

Analysis of invertebrates is limited by a lack of specific data; however, the size of the SEA and diversity of habitats present is considered sufficient to encompass healthy populations of a large number of invertebrate species, in excess of 1,000 terrestrial species. The wetlands and aquatic habitats within the SEA support diverse faunas of freshwater and alkaline pool arthropods, including native fairy shrimp, brine flies, and tiger beetles. Insect orders are particularly well-represented taxonomically, with moderate levels of species endemism including *Coleoptera*, *Diptera*, Hymenoptera and nocturnal *Lepidoptera*.

Amphibians generally are not present within desert habitats, except where surface hydrology persists throughout the year or breeding season. A limited number of species may be abundant in desert riparian areas. The more moist woodland areas and canyon bottoms of the montane portions of the SEA support abundant populations of more common amphibians, and in Little Rock Creek, the southwestern arroyo toad. Several species of salamander may also be present within the mesic upper reaches of the creek drainages. Open desert scrub habitats generally support diverse reptile populations, and the overall herpetofauna of the SEA includes numerous lizard and snake species, along with western pond turtle and California desert tortoise.

Bird diversity within the SEA is related to habitat opportunities for year-round residents, seasonal residents, and migrating raptors and song birds. Open xeric scrub hosts a suite of birds typical of such sites over a wide range of deserts, while the transition zones in the southern portion of the SEA attract species with desert and montane habitat preferences. The most productive sites for birds are the riparian corridors and freshwater systems, which attract large numbers of migrants during spring and fall, and provide abundant cover and food resources for songbird breeding use. The desert riparian woodlands and rocky buttes provide nest sites for raptors, many of which forage widely over desert scrub and agricultural lands. The playa lakes and seasonal pools, along with the ponds near the dry lakes, attract large numbers of migrating shorebirds, waders and waterfowl, and provide important winter foraging and sheltering areas for waterfowl and birds of prey.

Wildlife species previously recorded, as well as those expected to occur, within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof the Los Angeles County SEAs*.

Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources.

Wildlife Movement

The SEA extends from the Angeles National Forest to the playa lakes within Edwards Air Force Base, encompassing most of the two largest drainages exiting the northern slope of the San Gabriel Mountain range. The geographical features of the SEA serve as a major habitat linkage and movement corridor for all wildlife species within its vicinity and in an intergenerational sense, many of the plant species. Ecologically generalist species (mountain lion, bobcat, coyote, gray fox, etc.) have the ability to move across such vast areas and through changing habitat types. For such species, the SEA may serve as an important system for long-term and genetic exchange among populations. For smaller or less-mobile species or taxa, which are narrowly restricted in their habitat needs, the SEA can serve as a broad linkage zone, in which individual movement can take place during seasonal population dispersal or over generations. This provides essential genetic exchange within and between metapopulations. The two drainages, combined with the upland terrestrial Desert-Montane transect portion of the SEA, ensure linkage and direct movement areas for all of the wildlife species present within the County portion of the Antelope Valley.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare. This is due to the species' declining or limited population sizes, which usually results from habitat loss. Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS). The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas." Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species. The desert tortoise and mountain yellow-legged frog have critical habitat in this SEA. The arroyo toad has nearby critical habitat and may be present in the SEA.

Sensitive Plan Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.The sensitive communities include: mesquite bosque, Joshua tree woodland, desert grassland, southern willow scrub, southern cottonwood-willow woodland, fresh-water swamp, alkali meadow, Mojave riparian forest, and desert dry wash woodland. These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Mount Gleason Indian paintbrush (*Castilleja gleasoni*) RPR 1B.2
- Desert cymopterus (*Cymopterus deserticola*) RPR 1B.2
- Barstow woolly sunflower (*Eriophyllum mohavense)* RPR 1B.2
- Mason's neststraw (*Stylocline masonii*) RPR 1B.1
- Robinson's pepper grass (*Lepidium virginicum* var. *robinsonii,*[*Lepidium virginicum* ssp. *menziesii*]) RPR 1B.2
- Short-joint beavertail (*Opuntia basilaris* var. *brachyclada*)RPR 1B.2
- Robbins' nemacladus (*Nemacladus secundiflorus* var. *robbinsii),* RPR 2.2
- Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*) RPR 1B.2.2
- San Antonio milk-vetch (*Astragalus lentiginosus* var. *Antonius*)RPR 1B.3
- Big Bear Valley woollypod (*Astragalus leucolobus*) RPR 1B.2
- Lancaster milk-vetch (*Astragalus preussii* var*. laxiflorus*) RPR 1B.1
- Peirson's lupine (*Lupinus peirsonii*) RPR 1B.3
- Rock Creek broomrape (*Orobanche valida* ssp. valida) RPR 1B.2
- Red rock poppy (*Eschscholzia minutiflora* ssp. *Twisselmannii*) RPR 1B.2
- San Gabriel linanthus (*Linanthus concinnus*) RPR 1B.2
- Parry's spineflower (*Chorizanthe parryi* var. *parry*) RPR 1B.
- Mojave spineflower (*Chorizanthe* spinosa) RPR 4.2
- Johnston's buckwheat (*Eriogonum microthecum* var. *johnstonii*)RPR 1B.3
- Alkali mariposa lily (*Calochortus striatus*)RPR 1B.2
- Parish's alkali grass (*Puccinellia parishii)* RPR 1B.1

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Arroyo toad (*Anaxyrus californicus*) FE, SSC

- Desert tortoise (G*opherus* agassizii) FT, ST
- Swainson's hawk (*Buteo swainsoni*) ST
- Western snowy plover (*Charadrius alexandrinus nivosus*) FT, ABC, SSC, BCC
- mountain plover (*Charadrius montanus*) FT, CSC
- Willow flycatcher (*Empidonax traillii*) SE
- American peregrine falcon (*Falco peregrinus anatum*) SE
- Bald eagle (*Haliaeetus leucocephalus*) FT
- White faced ibis (*Plegadis chihi*) ST
- Bank swallow (*Riparia riparia*)ST
- Mohave ground squirrel (*Xerospermophilus mohavensis)* ST
- Nelson's antelope squirrel (*Ammospermophilus nelsoni*) ST

In addition, several other state-listed species of special concern have the potential to occur:

- Western pond turtle (*Emys marmorata*) BLMS, SSC, FSS
- Mojave fringed-toed lizard (*Uma scoparia*) BLMS, SSC
- San Diego horned lizard (*Phrynosoma blainvillii*) BLMS, SSC, FSS
- Chuckwalla (*Sauromalus ater)* (unusual in the County)
- Two-striped garter snake (*Thamnophis hammondii*) BLMS, SSC, FSS
- Cooper's hawk (*Accipiter cooperi*) ~~CDFG~~CDFW Watch List
- Sharp-shinned hawk (*Accipiter striatus*)
- Tricolored blackbird (*Agelaius tricolor*) ABC, BLMS, SSC, BCC(nesting colony)
- Southern California (ashy) rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Bell's sage sparrow (*Amphispiza belli belli*) ABC, ~~CDFG~~CDFW Watch List, BCC
- Golden eagle (*Aquila chrysaetos)* CDF, ~~CDFG~~CDFW Fully Protected, ~~CDFG~~CDFW Watch List, BCC
- Short-eared owl (*Asio flammeus*) ABC, SSC

- Long-eared owl (*Asio otus*) SSC
- Burrowing owl (*Athene cunicularia*) BLMS, SSC, BCC
- Redhead (*Aythya americana*) SSC
- California spotted owl (*Strix occidentalis occidentalis*) ABC, BLMS, SSC, FSS, BCC
- Ferruginous hawk(*Buteo regalis*) ~~CDFG~~CDFW Watch List, BCC
- Vaux's swift *(Chaetura vauxi)* SSC
- Black tern (*Chlidonias niger*) SSC
- Northern harrier (*Circus cyaneus*) SSC
- California gull (*Larus californicus*) ~~CDFG~~CDFW Watch List
- Yellow warbler (*Dendroica petechia brewsteri*) SSC, BCC
- California horned lark (*Eremophila alpestris actia*) ~~CDFG~~CDFW Watch List
- Merlin (*Falco columbarius*) ~~CDFG~~CDFW Watch List
- Prairie falcon (*Falco mexicanus*) ~~CDFG~~CDFW Watch List, BCC
- Yellow-breasted chat (*Icteria virens*) SSC
- Least bittern (*Ixobrychus exilis*) SSC, BCC
- Loggerhead shrike (*Lanius ludovicianus)* SSC, BCC
- White-faced ibis (*Plegadis chihi*) ~~CDFG~~CDFW Watch List
- Le Conte's thrasher (*Toxostoma lecontei*) ABC, SSC, BCC
- Gray vireo (*Vireo vicinior*) ABC, BLMS, SSC, BCC
- Yellow-headed blackbird (*Xanthocephalus xanthocephalus*) SSC
- Osprey (*Pandion haliaetus*) CDF, ~~CDFG~~CDFW Watch List
- American white pelican (*Pelecanus erythrorhynchos*) SSC
- Double-crested cormorant (*Phalacrocorax auritus*) ~~CDFG~~CDFW Watch List
- Pallid bat (*Antrozous pallidus*) BLMS, SSC, FSS, WBWG High Priority
- Pallid San Diego pocket mouse (*Chaetodipus fallax pallidus*) SSC

- Townsend's big-eared bat (*Corynorhinus (Plecotus) t. townsendii*) BLMS, SSC, FSS, WBWG: High Priority
- Spotted bat (*Euderma maculatum*) BLMS, SSC, WBWG High Priority
- California mastiff bat (*Eumops perotis californicus*) BLMS, SSC, WBWG High Priority
- Pocketed free-tailed bat (*Nyctinomops femorosaccus*) SSC, WBWG Medium Priority
- Big free-tailed bat (*Nyctinomops macrotis)* SSC, WBWG High Priority
- Southern grasshopper mouse (*Onychomys torridus ramona*) SSC
- Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*) SSC, FSS
- American badger (*Taxidea taxus*) SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE ANTELOPE VALLEY SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	Critical habitat for the only known Antelope Valley population of the federally-endangered arroyo toad is adjacent to Little Rock Reservoir, upstream in Little Rock Creek, and some may still be found downstream of the dam in the SEA. The SEA encompasses much of the County ranges of the federally-threatened California desert tortoise, including much of the County critical habitat for the tortoise. The state-threatened Mohave ground squirrel occurs throughout much of the SEA. The SEA includes some of the critical habitat of mountain yellow-legged frog in the South Fork of Big Rock Creek. It includes habitat designated in the Western Mojave Plan (WEMO) for the alkali mariposa lily, which is a rare lily of the desert floor.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The mesquite bosque, sand sheet, rocky butte, desert riparian woodland, and alluvial fan sage scrub habitats are unique and regionally restricted biotic communities encompassed by the SEA. Desert species not, or rarely, found elsewhere in the County, such as verdin, black-throated sparrow, Mojave rattlesnake, desert banded gecko, Leech's prionid borer, and mesquite borer, occur within these habitats. Additionally, the ponds and other riparian and wetland systems in the northern portion of the SEA support numerous water birds and raptors not found elsewhere in the County.

Criterion		Status	Justification
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The desert alluvial fan sage scrub, Joshua tree woodland, desert riparian woodland, mesquite bosque, alkali meadow/marsh, desert freshwater marsh, playa lake and seasonal pool habitats are located within, are unique to, or best represented within, the SEA.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, migrating grounds and is limited in availability either regionally or in the County.	Met	The freshwater habitats within and around Rosamond, Buckhorn and Rogers dry lake basins have large concentrations of migratory and resident waterfowl and birds of prey, providing them with essential seasonal and permanent resources. The rocky desert buttes are unique roosting, sheltering, perching and nesting sites for birds of prey and bats. This SEA is centered on migratory routes for both plants and animals along principal desert washes and buttes that connect the mountains to freshwater playas.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The mesquite bosque that is located within the SEA is clearly at an extreme of its geographical range, along with its associated biota, such as the mesquite borer. Edge populations usually represent an unusual genetic variation in a population or community, and therefore meet the criterion of scientific interest as well as the criterion of a population at the extreme physical/geographical limit of its range.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The SEA encompasses some of the most biotically intact acreages of Joshua tree woodland, desert riparian woodland, and desert alluvial fan sage scrub remaining in the County. Mesquite was formerly widely distributed in the Antelope Valley, but due to harvesting, is now limited to a few protected areas, such as the Edwards Air Force Base.

In conclusion, the area described is an SEA because it contains: A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) populations of scientific interest at the edge of their range including the desert tortoise, the mesquite bosque, and the Mojave ground squirrel; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Cruzan Mesa Vernal Pools SEA

Location

General

The Cruzan Mesa Vernal Pools Significant Ecological Area (SEA) lies north of the Santa Clara River

southeast of Bouquet Canyon. The SEA boundaries encompass the watershed and drainages of the Cruzan Mesa and Plum Canyon vernal pools, which are considered as a single ecosystem within the SEA. Vernal pools are a rare habitat. They are floored by clay or other substrates that retain the water of spring rains for a period of months. The pool dries primarily by evaporation. The fauna and flora are adapted to this regimen, which often forms propagules that can last through years of dessication. The pools are ephemeral, and may not fill every year. The fauna may be specific to an area of pools. Most biota is spread from pool to pool in mud, which adheres to the feet of birds and other animals that visit the pools.

The SEA is located within the unincorporated area of the County and lies entirely within the United States Geological Survey (USGS) 7.5' California Mint Canyon Quadrangle.

General Boundary and Resources Description

The SEA boundaries generally follow sub-watershed boundaries and occasionally extend beyond the sub-watershed boundary into areas to encompass vegetation, such as coastal sage scrub. The vernal pools in the northwest segment of the SEA are bounded in part by a sub-watershed boundary, but are primarily based on land formations that would adversely affect the vernal pools if altered to a great degree. This segment encompasses the vernal pool upland areas that contribute to the biological function of the vernal pool ecosystem. This SEA area includes most of the local federally-designated critical habitat for the threatened vernal pool plant, spreading navarretia (*Navarretia fossalis*, FT).

The SEA includes mesas, canyons and interior slopes, with Plum Canyon Creek running east-west through the southern portion of the SEA. The extent of the SEA encompasses the watershed, which supports both regionally unique vernal pools, including their immediate watersheds and the corridor between them. Plum Canyon forms the major drainage running east-west through the southern portion of the SEA, which drains west toward Bouquet Canyon. Uplands within the SEA are comprised of slopes and canyons, which support coastal sage scrub or scrub-chaparral vegetation. The Cruzan Mesa vernal pool complex lies within an elevated, topographically enclosed basin atop an eroded foothill between Mint and Bouquet canyons. Plum Canyon vernal pool, which is situated in a landslide depression on a hillside terrace, is smaller than the Cruzan Mesa pools, but possesses the same essential vernal pool characteristics as the larger system, and the two areas together form an ecologically functional unit.

The seasonally wet vernal pools and surrounding open coastal sage scrub and chaparral slopes support migrant and resident birds, other native sage scrub vertebrate species, and a number of sensitive taxa, including Riverside fairy shrimp, western spadefoot toad, ashy rufous-crowned sparrow, Bell’s sparrow, and possibly coastal California gnatcatcher. The steep cliffs that surround the Cruzan Mesa vernal pools, especially along the southeast and north margins, provide protected sites for perching, roosting and nesting by a variety of birds of prey, including great horned owl, barn owl, red-tailed hawk, prairie falcon, and golden eagle. The Plum Canyon vernal pool is hidden from view from the Plum Canyon roadway, and receives little human attention. Trash dumping, shooting and off-road vehicle activities have occurred within a few meters of the margin of the pool basin, but the pool shows only limited evidence of human intrusion.

Vegetation

The SEA encompasses formations of the following: vernal pool aquatics and emergent species;

coastal sage scrub; mainland cherry forest; chaparral; and ruderal non-native grassland. Dirt roads inside the SEA are bordered by non-native grassland and other ruderal plant species. The vernal pool margins support limited densities of native grasses, but these do not form separate communities and are included within the vernal pool floral matrix. Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.* Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Vernal Pool Sites:Occur in several different areas within the SEA where unique sub-surface conditions of shallow layers of less permeable horizons allow for seasonal accumulations of freshwater. True vernal pools, which are rare in Southern California and extremely rare in the County, form seasonally in shallow, closed basins, usually where a lens of heavy clay soil holds surface water following rainfall events. Agency-listed sensitive plant species occurring within both of the SEA pool systems include California Orcutt grass and spreading navarretia, along with other vernal pool endemics such as hairgrass, woolly-marbles, waterwort, *Mimulus latidens*, and water-starwort.

Corresponding MCV communities:

- *Alopecurus geniculatus* (water foxtail meadows) Provisional Herbaceous Alliance
- *Eleocharis macrostachya* (pale spike rush marshes) Herbaceous Alliance
- *Juncus arcticus (var. balticus, mexicanus* [*Juncus balticus* ssp. *ater, Juncus mexicanus*]) (Baltic and Mexican rush marshes) Herbaceous Alliance
- *Juncus (oxymeris, xiphioides)* (iris-leaf rush seeps) Provisional Herbaceous Alliance

Coastal Sage Scrub:Occurs throughout the slopes and ridges of most of the SEA, in places intermixed with chaparral elements. To some extent, the mosaic of coastal sage and chaparral reflects the fire history of any given portion of the site, with scrub formations generally occurring on sites that have recently burned. However, some slopes within upper Plum and Mint canyons, where no fires have occurred for over 30 years, still support “pure” coastal sage scrub, which suggests that the formation is a climax community on those sites.

Dominant species on most slopes within the SEA are California sagebrush, woolly blue-curls, chaparral yucca, black sage, Acton encelia, white sage, and chamise. A variety of less dominant associated species is also present, including lance-leaved live-forever, common tarplant, California buckwheat, beavertail cactus, turkish rugging, and Peirson's morning-glory. Disced or cleared areas have regrown with a dense cover of oats and bromes, California poppy, fiddleneck, several species of lupines, popcorn flower, comb-bur and other disturbance-favored native annuals. Lessfrequently disturbed portions of the upper watershed basin support dense stands of chamise. California scrub oak chaparral with yerba santa is abundant along dirt roads and other disturbed areas. Where ground-water levels permit, giant rye grass, Mexican elderberry, acourtia, redberry, toyon, holly-leaved cherry, Fremont cottonwood, western sycamore, and arroyo willow occur in the lower portions of canyons and along Plum Canyon Creek.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Dendromecon rigida* (bush poppy scrub) Shrubland Alliance
- *Isocoma menziesii* (Menzie's golden bush scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub)Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Ericameria linearifolia* (narrowleaf goldenbush scrub) Provisional Shrubland Alliance
- *Lotus scoparius* ([*Acmispon glaber*] deer weed scrub) Shrubland Alliance
- *Lupinus albifrons* (silver bush lupine scrub) Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub)Shrubland Alliance

Non-Native Grassland:Generally consists of invasive annual grasses, which are primarily of Mediterranean origin.It has become the dominant ground cover on disturbed sites throughout the western U.S. Common species within this "community," which is a ruderal formation and not a true habitat or community, include oats, bromes, foxtail chess, and other grasses, along with wild mustards, yellow star thistle, wire lettuce, sow thistle, milk thistle, and other disturbance-favored "weedy" taxa. Non-native ruderal formations occur over most of the Cruzan Mesa around the vernal pools, where coastal sage scrub has been disturbed or removed, in small strips and patches through the SEA—primarily along disturbed dirt road edges and where grading or other substrate disturbances have not regrown to native species.

Corresponding MCV communities:

- *Avena (barbata, fatua)* (wild oats grasslands) Semi-Natural Herbaceous Stands
- *Brassica (nigra) and other mustards* (upland mustards) Semi-Natural Herbaceous Stands
- *Bromus (diandrus, hordeaceus)-Brachypodium distachyon* (annual brome grasslands) Semi-Natural Herbaceous Stands
- *Bromus rubens-Schismus (arabicus, barbatus)* ([*Bromus madritensis* ssp. *rubens*] red brome or Mediterranean grass grasslands)Semi-Natural Herbaceous Stands

- *Centaurea (solstitialis, melitensis)* (yellow star-thistle fields)Semi-Natural Herbaceous Stands
- *Lolium perenne* ([*Festuca perennis*] perennial rye grass fields)Semi-Natural Herbaceous Stands

Mainland Cherry Forest:Is typically composed of tall stands of hollyleaf cherry on rocky, dry slopes. Within the SEA, this community is not well-developed and intermingles with chaparral. It can be found in a single narrow patch on a slope in the southwestern portion of the SEA.

Corresponding MCV communities:

- *Prunus ilicifolia* (hollyleaf cherry chaparral) Shrubland Alliance
- *Prunus virginiana* (choke cherry thickets) Provisional Shrubland Alliance

Wildlife

Wildlife diversity and abundance within the SEA are moderate, and commensurate with the relative homogeneity of the natural open space habitat types. Wildlife within much of the SEA is comprised of species that typically occur within coastal sage scrub. Birds of prey frequently forage over the pools and open grasslands, which form following the seasonal drying of the surface water. The Cruzan Mesa and Plum Canyon vernal pools provide rare surface water habitat for wildlife in an otherwise semi-arid scrub region, and the ponds attract moderate numbers and diversity of migratory waterfowl. The peripheral areas of coastal sage scrub around the vernal pools provide important shelter, terrestrial refugia, ecotonal and edge habitat for wildlife. A number of local wildlife species are more-or-less dependent upon coastal sage scrub or scrub-chaparral formations, while other species are strictly limited to seasonal pool habitats. The two vernal pool systems in the SEA, along with the coastal sage scrub-chaparral uplands surrounding and connecting them, constitute a single, integrated functional ecosystem for wildlife species within the SEA boundaries, as well as a part of the larger regional scrub-chaparral ecosystem.

While the analysis of invertebrates on any particular site is usually limited by a lack of specific data,containing only two primary natural habitat types within the SEA ensures that there is sufficient acreage to support healthy populations of present invertebrate species, which could be several hundred terrestrial species. The vernal pools, when ponded, form aquatic habitats for a moderately diverse fauna of freshwater arthropods and other invertebrates, including native fairy shrimp, aquatic flies, diving beetles, water scavengers, ostracods, and snails. At present, one ground beetle species (insect order *Coleoptera*), which is endemic to vernal pools, is known from the SEA.

Generally, amphibians are relatively common in coastal sage scrub habitats, with persistent surface hydrology during the breeding season.The SEA supports abundant populations of Pacific chorus frog, western toad, and western spadefoot toad. At least two species of salamander may also be present within more mesic portions of the surrounding canyons and chaparral.

Reptile populations expected to be within the SEA include numerous lizard species, including San Diego banded gecko, yucca night lizard, side-blotched lizard, western fence lizard, western skink, San Diego alligator lizard, coastal western whiptail, coastal horned lizard, and silvery legless lizard. A robust snake fauna is also expected to be within the SEA, including western blind snake, coachwhip (“red racer”), chaparral whipsnake, coastal patch-nosed snake, California rosy boa, San Diego gopher snake, California kingsnake, California mountain kingsnake, night snake, and

Southern Pacific rattlesnake.

Bird diversity within the SEA is related to habitat opportunities for year-round residents, seasonal residents, migrating raptors and song birds. Open coastal sage scrub hosts a suite of birds that are typical of such sites, at lower elevations over most of the coastal slopes of Southern California. The most productive sites for resident coastal sage scrub and chaparral birds are around riparian and freshwater systems, which also attract large numbers of migrants during spring and fall. The vernal pools attract moderate numbers of migrating waders and waterfowl, and provide important winter foraging areas for resident and migratory birds of prey. Coastal sage and chaparral birds—resident or breeding within the SEA—include ashy rufous-crowned sparrow, Bell's sage sparrow, black-chinned sparrow, lark sparrow, California thrasher, spotted towhee, California towhee, phainopepla, northern mockingbird, lazuli bunting, and several species of hummingbird. In addition, species (western meadowlark, California horned lark, and perhaps also savannah and grasshopper sparrows) nest and forage in the grassland and ruderal habitats surrounding the vernal pools. Birds of prey that have been observed around the vernal pools include red-tailed hawk, northern harrier, prairie falcon, and golden eagle. Barn owl, great horned owl, and common raven nest in the cliffs surrounding Cruzan Mesa.

Wildlife species previously recorded, as well as those expected to occur, within the study area are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEAs*. Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

The vernal pools situated within this SEA serve as isolated, high-quality, habitat linkage sites for migratory waterfowl. The vernal pools teem with arthropod and amphibian activity, and provide essential feeding grounds for long-distance migrants, as well as for resident species of reptiles, birds and mammals. The ponds do not lie within any identified terrestrial movement routes for wildlife, but may serve as important seasonal watering sites for species moving through and across the Plum Canyon divide between Mint and Bouquet canyons. The Plum Canyon stream channel undoubtedly serves as a movement pathway for more mobile species of terrestrial mammals, but it no longer links any larger habitat areas directly due to land conversion in Mint and Bouquet canyons.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare. This is due to the species' declining or limited population size, which usually results from habitat loss. Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS). The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition.

The SEA is configured to encompass the regionally significant vernal pools and coastal sage scrub watershed, which supports them. Sensitive Holland plant communities within the SEA include vernal marsh, fresh-water swamp, coastal sage chaparral shrub; and in Plum Canyon, mainland cherry forest. We list here all Holland plant communities with the alliances in the new classification system.

The related alliances, even if not sensitive, may be critical to support the sensitive ones.

Sensitive Plant Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.The SEA is configured to encompass regionally significant communities, which include mainland cherry forest in Plum Canyon, vernal marsh, and fresh-water swamp. These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas." Critical habitat areas, after extensive study by experts, are judged to be essential to the conservation and maintenance of the species. The spreading navarretia has critical habitat areas that are coincident with the SEA.

Sensitive Plant Species

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- California Orcutt grass (*Orcuttia californica*) FE, SE, RPR 1B.1
- Spreading navarretia (*Navarretia fossalis)* FT, RPR 1B.1
- Slender-horned spineflower *(Dodecahema leptoceras)* FE, SE, RPR 1B.1
- Parry's spineflower (*Chorizanthe parryi* var*. parryi)* RPR 1B.1
- Orcutt's broadiaea (*Brodiaea orcuttii*) RPR 1B.1
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*) RPR 1B.2
- Plummer's mariposa lily (*Calochortus plummerae)*RPR 1B.2

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Vernal pool fairy shrimp (*Branchinecta lynchi*)FT
- San Diego fairy shrimp (*Branchinecta sandiegonensis*)FE
- Riverside fairy shrimp (*Streptocephalus wootonii*) FE
- Swainson's hawk (*Buteo swainsoni*)ST,ABC, FSS, BCC

- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)FC, FSS, BCC
- American peregrine falcon (*Falco peregrinus anatum*)FD, SD CDF, ~~CDFG~~CDFW Fully Protected, BCC
- Coastal California gnatcatcher (*Polioptila californica californica*)FT, ABC, SSC

In addition, there are animals recognized as state-listed species of concern that have the potential to occur:

- Western spadefoot (*Spea hammondii*) BLMS, SSC
- Coastal horned lizard (*Phrynosoma blainvillii*) BLMS, SSC, FSS
- Coast patch-nosed snake (*Salvadora hexalepis virgultea*) SSC
- Southern California (ashy) rufous-crowned sparrow (*Aimophila ruficeps canescens*) ~~CDFG~~CDFW Watch List
- Two-striped garter snake (*Thamnophis hammondii*) BLMS, SSC, FSS
- Bell's sage sparrow (*Amphispiza belli belli*) ABC, ~~CDFG~~CDFW Watch List, BCC
- Golden eagle (*Aquila chrysaetos)* CDF, ~~CDFG~~CDFW Fully Protected, ~~CDFG~~CDFW Watch List, BCC
- Burrowing owl (*Athene cunicularia*) BLMS, SSC, BCC
- Northern harrier (*Circus cyaneus*) SSC
- Prairie falcon (*Falco mexicanus*) ~~CDFG~~CDFW Watch List, BCC
- Loggerhead shrike (*Lanius ludovicianus*) SSC, BCC
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) SSC
- San Diego desert woodrat (*Neotoma lepida intermedia*) SSC
- Southern grasshopper mouse (*Onychomys torridus ramona*) SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE CRUZAN MESA VERNAL POOLS SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	The only known County populations of the federally- endangered Riverside fairy shrimp, and the state and federally-endangered California Orcutt grass, are found in the vernal pools within the SEA. The federally-threatened plant, spreading navarretia, also occurs in these pools, and the pools and much of the SEA are designated critical habitat for this plant.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The Cruzan Mesa and Plum Canyon vernal pools are regionally unique biotic communities with several plants found only in such habitat types. The pools support the Riverside fairy shrimp, western spadefoot toad, and at least one vernal pool endemic ground beetle.
C)	Within County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The Cruzan Mesa and Plum Canyon vernal pools are unique biotic communities within the County, with several plants only found in such habitat types. The pools support the Riverside fairy shrimp, western spadefoot toad, and at least one vernal pool endemic ground beetle species.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The vernal pools serve as concentrated breeding areas for several species of amphibians, including the sensitive western spadefoot toad. They also attract a diversity of waterfowl seasonally—chiefly species migrating through the area—which use the pools for resting and feeding. While other open water systems attract and support waterfowl, the vernal pools are located in remote, upland sites, away from other freshwater features.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Not met	Although the SEA does not contain biotic resources that are clearly an extreme in physical/geographical limitations, or represent unusual variation in a population or community (and therefore does not meet this criterion), it is of scientific interest due the extreme rarity of vernal pool communities, especially in the County.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Protection and sensitive management of the Cruzan Mesa and Plum Canyon vernal pools would preserve one of the few examples of such habitat type in the County.

The SEA meets several designation criteria and supports several regional biological values. These values include: A) sensitive plant species unique to seasonal pools on heavy clay soils—several of which are at the northernmost point in their overall ranges, and seasonal surface water, which

provide breeding sites for sensitive amphibians, including western spadefoot and Riverside fairy shrimp; B-C) a concentration of vernal pools, found in few places in the County and rare in the region, and their coastal sage scrub watershed, which serves as a hydrological filter, and seasonal ponds and surrounding mesic vegetation; D) vegetation that provides essential foraging and wintering sites for migrating birds that are otherwise uncommon on the coastal side of the San Gabriel Mountains, and steep cliffs surrounding the mesa tops with crevices and cavities providing roosting and nesting sites in the otherwise brush-covered hillsides; E-F) Rare habitat in Southern California, and the support of sensitive resources that are unique locally and regionally, and that biologists consider to be among the most sensitive habitat types in Southern California.

East San Gabriel Valley SEA

Location

General

The East San Gabriel Valley SEA is located in the eastern end of the San Gabriel Valley. The SEA includes some of the low hills that rim the San Gabriel Valley on the east. The SEA has several natural, interacting components that constitute an area-wide ecological unit. The SEA consists of five units. The location and configuration of this SEA and its parts are primarily defined by the urbanization of the eastern San Gabriel Valley, which has occurred over the more developable valley floor and lower slopes of the San Jose Hills. As a consequence, the SEA resembles an "archipelago" that encompasses portions, or islands, of undeveloped ridgelines, hilltops and drainages between the San Gabriel Mountains to the north and the Puente Hills to the south.

Generally, the topography within this SEA consists of moderate to steep hillsides with north, south, east and west slope aspects. Ridgelines vary in width, from narrow to broad, with well-defined drainages in between. One major drainage, Walnut Creek, and a man-made reservoir, Puddingstone Reservoir, are found within this SEA. Elevations range from a low of approximately 560 feet above Mean Sea Level (MSL) in the Walnut Creek drainage, to a high of approximately 1,375 feet above MSL at Buzzard Peak.

The SEA has several ridgelines and hilltops and the major drainage of Walnut Creek at the northern side of the San Jose Hills. In the last half of the 20th century, these areas have beensurrounded by urban development. Units 1-5 include: 1) South Hills Park and the surrounding undeveloped land in the City of Glendora north of Interstate-210; 2) The natural riparian section of Walnut Creek County Park. The SEA includes sections in the City of Covina and City of San Dimas; 3) Frank G. Bonelli Regional County Park (Bonelli Park); 4) Buzzard Peak, which is an extended ridge of undeveloped slopes to the west of Bonelli Park within the City of San Dimas, City of Walnut, and City of West Covina; and 5) Elephant Hill and an adjoining ridgeline in the City of Pomona. Along most of its boundaries, the SEA is bordered by developed properties. Large parts of this SEA are designated critical habitat for the federally-threatened coastal California gnatcatcher (*Polioptila californica californica*).

In its entirety, the SEA is located within the San Dimas, Glendora and Baldwin Park U.S. Geological Survey (USGS) 7.5' California Quadrangles.

General Boundary and Resources Description

Unit 1: The northernmost section of the SEA is the South Hills unit. Much of the SEA is “protected” in the South Hills Park of the City of Glendora. The SEA lies north of the Interstate-210, has its northwestern boundary along Big Dalton Wash (a concrete-lined flood control channel), and northeastern boundary along existing residential development in the floodplain of the wash and adjoining hills. The eastern boundary is also bordered by existing residential development. The southern boundary consists of the Interstate-210 right-of-way, and the western boundary lies along Glendora Avenue. Residential neighborhoods on the periphery (and not inside) of the South Hills Park are excluded, while external natural habitat is included in the SEA. An area of nursery fields in a central position of the park is included, as it is less than 40 acres in extent. Toward the eastern side of the SEA, there are some estate residences on the hills that are included, as they incorporate much natural habitat; however, denser neighborhoods are excluded from the SEA.

The South Hills are an area of chaparral and grasslands, and a northern stepping stone for wildlife (chiefly aerial) that move along the spine of the San Jose Hills between the San Gabriel Mountains of the Transverse Ranges, and the Puente and Chino Hills of the Peninsular Ranges on the southern side of the San Gabriel Valley. In South Hills Park, there are fine stands of walnut woodland in the upper elevations; northern ravines of oak woodland with walnut woodland in the upper elevations; what remains of the coast live oak woodland that once bordered the Big Dalton Wash; and excellent stands of prickly pear cactus covering some of the slopes. There are also grasslands with a dominant component of introduced mustards and some rocky exposures. Coastal sage scrub with alternating dominant components of California sagebrush (*Artemisia californica*), sumacs (*Rhus* spp.) and elderberries (*Sambucus* spp.) cover many of the slopes. Big Dalton Wash ischannelized, and much development has been inserted into what was formerly Big Dalton’s riparian oak woodland. This residential area forms a border for the northeast area of the SEA.

Unit 2: Thewesternmost portion of Walnut Creek begins where South Reeder Avenue crosses the Walnut Creek drainage on the border of the City of Covina and City of San Dimas. Walnut Creek runs along the northern base of the San Jose Hills and is a riparian interface between the rolling hill habitat and the coastal plain of the San Gabriel Valley. This segment encompasses the undeveloped creek bottom and flood plain, which is a relatively natural area along and adjacent to Walnut Creek,most of it preserved as Walnut Creek Park. The Creek and lower slopes of the San Jose Hills contain one of the best riparian oak woodlands in the County, with a mixture of ash, walnut, willows, and sycamores. The upper areas of the oak woodland transition into excellent examples of walnut woodlands. Traveling east from this point, the SEA is bordered to the north by residential areas on the plains and to the south by residential areas on the ridgelines above the Creek. Much of the habitat of interest is on the slope of the ridgeline above the Creek.

Unit 3: The Walnut Creek Park unit is connected to the Bonelli Park unit. The SEA continues east to the Interstate-210, where the drainage and the SEA underpass along with San Dimas Avenue. There is a fenced footpath on the south side of the underpass that wildlife and humans use extensively. On the east side of the Interstate-210, the boundaries diverge and follow the freeway right-of-way to the north and to the south. At the edge of natural habitat about a 0.2 mile north, the boundary turns northeast with Walnut Creek. There are two fingers of creek tributaries: one encircles its stream course as far as the Arrow Highway, and the other includes the undeveloped north-facing slope of a low ridge that has residential development along the top. The SEA ends at a Union Pacific rail line. The edges of Walnut Creek have business parks and industrial properties, as well as residential areas.

The SEA boundary returns back west from the two fingers to circle around the west side, and excludes the Raging Waters theme park. From Raging Waters, the SEA boundary follows along the northern boundary of Bonelli Park, which is the largest unit of the SEA. This area of Bonelli Park includes the 250-acre Puddingstone Reservoir, which is a flood control basin created by damming the main course of Walnut Creek. Puddingstone Reservoir is home to many resident birds, including a large population of American coots (*Fulica americana*). Notably, Puddingstone Reservoir also hosts a great variety and number of migrating waterfowl and other birds during the spring and fall, and provides riparian habitat for birds and other animals that are riparian obligates. Following along Puddingstone Drive to the Puddingstone Channel, the SEA eastern boundary turns south to conform to the eastern boundary of Bonelli Park. Within Bonelli Park, developed areas include the Mountain Meadows Golf Course on the west side of the Park, the campground area for recreational vehicles, the northern parking area of Puddingstone Reservoir, and the developed south side of Puddingstone Reservoir. On the south side of the park, the boundary borders the Interstate-10 to the junction with State Route-57, and then turns north following the east side of State Route-57, back to the undercrossing of San Dimas Avenue.

Bonelli Park (with the exception of the built areas above), Puddingstone Reservoir, and Raging Waters are critical habitat for the coastal California gnatcatcher. There are a number of breeding pairs that occur in natural areas of coastal sage scrub in Bonelli Park. Another species of note is the many-stemmed dudleya or live-forever (*Dudleya multicaulis*), which is an uncommon plant found on the picturesque rocky outcrops of the Glendora volcanics formation. This plant is at its northernmost extent in this area of the San Gabriel Valley, and is more common in Orange County.

Unit 4: Across the State Route-57 from Bonelli Park, the San Jose Hills continue southwest, with residential areas dispersed among intervening grassland and chaparral natural areas. This area is considered an extension of the Buzzard Peak ridgeline. The natural area that continues the habitat in Bonelli Park is roughly a central area of a north-facing wooded area and a southern area of a ridgeline with steep slopes along the Interstate-10. The SEA is chiefly on the undeveloped upper ridge areas, and critical habitat for the coastal California gnatcatcher closely follows the SEA in the southern part along the ridgeline and the Interstate-10. The SEA and critical habitat for the gnatcatcher cross the highway with the ridgeline, and extend to Buzzard Peak

Buzzard Peak and its associated lands begin in the east along a ridgeline that is immediately north of the California State Polytechnic University (Cal Poly), Pomona campus. The western section of the SEA is undeveloped, but may in the path of future growth. This component follows the ridgeline west to where it crosses Grand Avenue and continues in a westerly direction, which encompasses a series of minor ridgelines and drainages with highly dispersed residential areas. Moving east to west, its northern boundary is marked by Interstate-10, developed portions of the Forest Lawn Memorial Park Covina Hills and residential areas. Moving from east to west, its southern boundary is marked by developed and cultivated areas of the Cal Poly campus, Amar Road and residential areas. Along their entire lengths, the northern and southern boundaries follow highly circuitous alignments at the edge of developed landscape. A lobe of the SEA extends into the natural area that separates Cal Poly Pomona from Mt. San Antonio College. Gnatcatcher critical habitat covers most of this segment of the SEA, and extends beyond Grand Avenue as far as State Route-39 (Azusa Avenue), with some islands of critical habitat in nearby hilltops.

Unit 5: A final component of this SEA is located south of the intersection of State Route-71 and State Route-57 in the City of Pomona, at a ridgeline that is bordered chiefly by development that has an

undisturbed remnant of the original habitat: north-facing slopes of oak and walnut woodland. South-facing slopes consist of a mixture of dispersed chaparral, coastal sage scrub, and grasslands. There is a lobe that is north of Mission Boulevard in the City of Pomona on Elephant Hill, and a lobe south of Mission Boulevard. On Elephant Hill, the northern boundary is the Metrolink track.The eastern boundary is bordered by industrial development; the southern boundary is Mission Boulevard in the southeast; and the periphery of apartments along Brea Canyon Road, Appian Way, and Ferrara Court in the southwest. The western boundary is State Route-57. The Spadra cemetery with many introduced eucalyptus trees is not included. The ravines of Elephant Hill have fine examples of walnut woodland and the upper slopes have grassland, often dominated by mustards, with some areas of prickly-pear scrub.

Southeast of Mission Boulevard, the SEA is bordered by Mission Boulevard. The north-facing slopes with excellent oak and walnut woodland are bordered by residential areas at the base of the steep slopes. The eastern end is bordered by North Ranch Road, and the southwest is bordered by the dense residential community of Phillips Ranch in the City of Pomona. The crest of the ridge is rolling grasslands that are dominated by introduced mustards, and the slopes have a mix of dispersed grasslands, chaparral, coastal sage scrub, and prickly pear scrub.

The SEA encompasses several different local jurisdictions, including the unincorporated area of the County, City of Covina,City of Glendora, City of La Verne, City of Pomona, City of San Dimas, City of Walnut, and City of West Covina.

Vegetation

The variety of topography, soil types, slope aspects and water availability within this SEA create a range of physical habitats that support numerous plant species. The biological communities found in this SEA vary according to physical habitat conditions (i.e., slope exposure, soil type and depth, and the availability of water) and the area's history of grazing practices. Elevation plays almost no role in defining habitat types. Many slopes support oak and walnut woodland, which often intergrade with prevalent stands of mixed chaparral. Coastal sage scrub is also found on slopes with shallower, drier soils. Drainages are typically vegetated with oak riparian woodlands and forests, with stands of western sycamore (*Platanus racemosa*) and willow woodland. More moderate slopes and broader ridgelines have been subjected to livestock grazing. In these areas, the dominant vegetation consists of open non-native grassland. Oftentimes, grassland exists as the understory ground cover for wooded areas, which creates oak and walnut savannahs. Small isolated areas of freshwater marsh are also found around Puddingstone Reservoir.Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.* Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Brief descriptions and general locations of each plant community present within the SEA are provided below, including oak woodland, oak riparian forest, walnut woodland, willow woodland, chaparral, coastal sage scrub, freshwater marsh, and non-native grassland.

Oak Woodland:A plant community dominated by species of the oak genus (*Quercus*). Within this SEA the dominant species is the coast live oak (*Quercus agrifolia* var. *agrifolia*), which typically grows to heights of 20 to 40 feet and forms either closed or open canopies. Understory vegetation varies from grassland in areas that are subject to grazing, to shrubs where the topography is steeper and/or grazing has been relaxed. This vegetation may also intergrade with shrub communities.

Within this SEA, oak woodland is scattered throughout all components where it is most prevalent on northfacing slopes and in drainage bottoms.

Oak Riparian Forest: A highly related community to the oak woodland found in the SEA. It is also dominated by coast live oak. The primary difference between oak woodland and oak riparian forest is the greater availability of water in riparian situations, which is expressed in a dense tree canopy cover and tree clusters. A greater number of hydrophytic (moister favoring) plant species are also found in the understory. Typical riparian trees, such as western sycamore and willows (*Salix* spp.), occasionally occur. Oak riparian forest is well developed within Walnut Creek. Riparian trees are also scattered in other drainages throughout the Buzzard Peak component of this SEA.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance
- *Quercus engelmannii* (Engelmann oak woodland) Woodland Alliance

Walnut Woodland: Often intergrading with oak dominated woodlands or developed as a distinct community. This community is dominated by the Southern California black walnut (*Juglans californica*), which grows 10 to 30 feet high. More often than not, the Southern California black walnut grows in open stands; however, closed tree canopies are not uncommon. In similar fashion to oak woodlands, its understory varies from grasses to shrubs. Thus, it forms stands ranging from savannahs to forests throughout the SEA. It is most common within Bonelli Park and Walnut Creek Park, South Hills, and Buzzard Peak components of the SEA.

Corresponding MCV communities:

- *Juglans californica* (Southern California black walnut groves) Woodland Alliance

Southern Willow Scrub: A well-developed southern willow scrub community that is found along Live Oak Creek upstream and at the point where the Creek flows into Puddingstone Reservoir in the Bonelli Park and Walnut Creek Park component of the SEA. Smaller patches of this community are also found scattered along drainages in the Buzzard Peak component. This community is dominated by species of willow, which form nearly monotypic stands due to their dense growth. These stands generally reach 10 to 20 feet in height with little understory vegetation.

Corresponding MCV communities:

- *Salix exigua* (sandbar willow thickets) Shrubland Alliance
- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance

Mixed Chaparral:A shrub community composed of robust species. Within the SEA, these species include laurel sumac (*Malosma laurina*), toyon (*Heteromeles arbutifolia*), lemonadeberry (*Rhus integrifolia*) and western blue-elderberry (*Sambucus nigra* var. *caerulea*). Along with other shrub species, chaparral forms dense vegetation covers that grow 5 to 10 feet in height. The development of chaparral is most pronounced within the South Hills, Bonelli Park and Walnut Creek Park, and Buzzard Peak components of the SEA.

Corresponding MCV communities:

- *Adenostoma fasciculatum* (chamise chaparral) Shrubland Alliance
- *Ceanothus leucodermis* (chaparral whitethorn) Shrubland Alliance
- *Ceanothus oliganthus* (hairy leaf ceanothus chaparral) Shrubland Alliance
- *Prunus ilicifolia* (holly leaf cherry chaparral)Shrubland Alliance
- *Rhus ovata* (sugarbush chaparral)Shrubalnd Alliance

Coastal Sage Scrub: Communities of coastal sage scrub exhibit less robust structure within this SEA. This plant community is dominated by California sagebrush (*Artemisia tridentata*), California brittle bush (*Encelia californica*), black sage (*Salvia mellifera*), and California buckwheat (*Eriogonum fasciculatum*). Coastal sage scrub also forms dense stands, which grow three to four feet in height. Within this SEA, it is generally found in scattered patches, which are highly integrated with mixed chaparral. These communities are primarily located in the South Hills, Bonelli Park and Walnut Creek Park, Via Verde, and Buzzard Peak components of the SEA.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*] (deer weed scrub) Shrubland Alliance
- *Opuntia littoralis* (coast prickly pear scrub) Shrubland Alliance

Non-Native Grassland:Consists of non-native annual grasses and forbs. These opportunistically growing species include brome grasses, wild oats and mustards. Characteristic of other parts of Southern California, this community became established as a result of livestock grazing.In the process, native vegetation is removed, sometimes by mechanical means, and replaced by more opportunistic species. Non-native grassland is found throughout the SEA.

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*)Semi-Natural Herbaceous Stands

- *Brassica* (*nigra*)and other mustards Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus*, *hordeaceus*)-*Brachypodium distachyon* Semi-Natural Herbaceous Stands
- *Bromus rubens*-*Schismus* (*arabicus*, *barbatus*)Semi-Natural Herbaceous Stands
- *Centaurea* (*solstitialis*, *melitensis*)(yellow star-thistle fields)Semi-Natural Herbaceous Stands
- *Lolium perenne* (perennial rye grass fields) Semi-Natural Herbaceous Stands

Freshwater Marsh: Small areas that support freshwater marshand found at scattered locations along the shoreline Puddingstone Reservoir. This community may also exist at other locations, in or adjacent to artificially created impoundments used to water livestock. Freshwater marsh requires perennially shallow water or saturated soils. Dominant plants are comprised of emergent species, including cattails and bulrushes.

Corresponding MCV communities:

- *Schoenoplectus californicus* (California bulrush marsh) Herbaceous Alliance
- *Typha* (*angustifolia*, *domingensis*, *latifolia*)(cattail marshes) Herbaceous Alliance
- *Lemna* (*minor*) and relatives (duckweed blooms) Provisional Herbaceous Alliance

Wildlife

Wildlife populations within the SEA are generally expected to reflect lower diversity and abundance of habitat types. This is due to the influences of surrounding development and location of recreational uses over relatively large areas of the SEA. Analysis of invertebrates on any given site is generally limited by a lack of specific data; however, the SEA is considered sufficient to encompass moderately healthy populations of common invertebrate species. Fair numbers of amphibians are expected to be present primarily due to the aquatic and semi-aquatic habitats provided by Puddingstone Reservoir, and riparian habitats along Live Oak Channel and Walnut Creek. Diversity and evenness among these populations, however, is likely to be degraded due to a history of urbanization, which results in only a few species that are able to adapt accordingly.

Similar effects are anticipated for reptiles. Reptilian species that are typically found in suburban and rural areas are expected to occur in relatively high numbers. Less common, and perhaps, locally extinct would be those species that are more secretive in their habitats and/or not as prolific.

A surprisingly high diversity of birds is documented within this SEA, including a large population of coastal California gnatcatcher (*Polioptila californica californica*), which is a federally-threatened species. For numerous upland, raptorial, and water associated birds, the SEA provides a mosaic of habitats. Between woodland, shrubland, grassland and wetlands, diverse populations of birds are able to meet nesting, foraging, and migratory requirements.

Mammal populations also reflect the urbanized areas imparting this SEA. Small mammals are expected to be uneven in their diversity, with more adaptive, introduced European species in greater numbers compared to other species. Medium-sized mammal populations are expected to exhibit the

same characteristics. Large mammals are largely absent on a resident basis.

All wildlife species previously recorded, as well as those expected to occur within this SEA are tabulated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEAs*. Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

The SEA represents the only regional wildlife linkage between the San Gabriel Mountains and the Puente Hills and Chino Hills complex. Unlike the commonly held concept of a corridor, however, this SEA contains a series of discontinuous habitat blocks and patches, rather than an unbroken corridor for movement. This SEA facilitates movement and exchange between larger habitat areas by permitting terrestrial "island-hopping" between the SEA components.

Using birds as an example, movement may be initiated by an individual or group of birds in either the San Gabriel Mountains or the Puente Hills. Larger species, with the capacity to cover long distances, may make the passage as one segment of its journey. Smaller species, however, that lack the physical or behavioral capacity may not be able to attain this movement under normal circumstances. By utilizing various components of the SEA, the same species can cover this journey in several smaller trips. The same example may also apply to winged insects and wind-borne plant propagules and pollen. Interaction between, not just through the components, can occur as well.

This same function probably does not apply to other taxonomic groups. It is highly doubtful that amphibian, reptile and most mammal populations use this corridor as effectively as birds, if at all. Mule deer (*Odocoileus hemionus*), for example, do not occur within Bonelli Park, but are common in the San Gabriel Mountains and the Puente Hills. However, some mammals that tolerate urban environments, such as Virginia opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*), use the corridor in the manner previously described. Even mountain lion (*Puma concolor*) periodically enter Bonelli Park and Walnut Creek Park from the outside, by way of routes related to SEA components.

The manner in which the SEA allows wildlife populations in different areas to interact is less than ideal. However, exchange in the manner described above is dictated by the widespread urbanization of the region. “Island hopping” is the only remaining connection for regional interaction that can contribute to the maintenance of genetic variability and health of regional wildlife populations.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare. This is due to the species’ declining or limited population sizes, which usually results from habitat loss. Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS). The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific “critical habitat areas.” Critical habitat areas, after extensive study by experts, are judged to be essential to conservation

and maintenance of the species. In this SEA, extensive areas are critical habitat for the coastal California gnatcatcher.

Sensitive Plant Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.Vegetation communities include Engelmann oak woodland, Southern California black walnut groves, holly leaf cherry chaparral, and California brittle bush scrub,which occur throughout the SEA. These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system. The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution). In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added: .1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Nevin’s barberry (*Berberis nevinii*)FE, SE, RPR 1B.1
- Round-leaved filaree (*California macrophylla*)RPR 1B.1
- Southern tarplant (*Centromadia parryi* ssp. *australis*)RPR 1B.1
- Smooth tarplant (*Centromadia pungens* ssp. *laevis*)RPR 1B.1
- Peruvian dodder (*Cuscuta obtusiflora* var. *glandulosa*)RPR 2.2
- San Gabriel Mountains dudleya (*Dudleya densiflora*)RPR 1B.1
- Many-stemmed dudleya (*Dudleya multicaulis*)RPR 1B.2
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)RPR 1B.1
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)RPR 1B.1
- Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)RPR 1B.2
- Brand's star phacelia (*Phacelia stellaris*)FC, RPR 1B.1

- White rabbit-tobacco (*Pseudognaphalium leucocephalum*)RPR 2.2
- Parish's gooseberry (*Ribes divaricatum* var. *parishii*)RPR 1A
- Chaparral ragwort (*Senecio aphanactis*)RPR 2.2
- San Bernardino aster (*Symphyotrichum defoliatum*)RPR 1B.2
- Thread-leaved brodiaea (*Brodiaea filifolia*)FT, SE, RPR 1B.1
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)RPR 1B.2
- Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*)RPR 1B.2
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2
- Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*)RPR 1B.2
- Vernal barley (*Hordeum intercedens*)RPR 3.2
- California satintail (*Imperata brevifolia*)RPR 2.1
- California Orcutt grass (*Orcuttia californica*)FE, SE, RPR 1B.1

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA, based on habitat requirements and known range attributes:

- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- Rosy boa (*Charina trivirgata*)BLMS, FSS
- Western pond turtle (*Emys marmorata*)BLMS, FSS, SSC
- San Bernardino mountain kingsnake (*Lampropeltis zonata parvirubra*)FSS, SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Coast patch-nosed snake (*Salvadora hexalepis virgultea*)SSC
- Two-striped garter snake (*Thamnophis hammondii*)BLMS, FSS, SSC
- Cooper's hawk (*Accipiter cooperii*)~~CDFG~~CDFW Watch List
- Tricolored blackbird (*Agelaius tricolor*)BCC, BLMS, SSC, USBC, AWL, ABC

- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Grasshopper sparrow (*Ammodramus savannarum*)~~CDFG~~CDFW Special Animals List
- Long-eared owl (*Asio otus*)SSC, LAA
- Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*)BCC, FSS, SSC
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)FC, BCC, FSS, SE
- Black swift (*Cypseloides niger*)BCC, SSC, USBC, AWL, ABC
- White-tailed kite (*Elanus leucurus*)~~CDFG~~CDFW Fully Protected
- Southwestern willow flycatcher (*Empidonax traillii extimus*)FE, FSS, SE, USBC, AWL, ABC
- Yellow-breasted chat (*Icteria virens*)SSC
- Coastal California gnatcatcher (*Polioptila californica californica*)FT, SSC, USBC, AWL, ABC
- Bank swallow (*Riparia riparia*)ST
- Least Bell's vireo (*Vireo bellii pusillus*)FE, BCC, SE, USBC, AWL, ABC
- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)SSC
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Hoary bat (*Lasiurus cinereus*)WBWG Medium
- Western yellow bat (*Lasiurus xanthinus*)WBWG High
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)SSC
- Fringed myotis (*Myotis thysanodes*)BLMS, WBWG High
- Long-legged myotis (*Myotis volans*)BLMS, SSC, WBWG Medium
- Yuma myotis (*Myotis yumaensis*)BLMS, WBWG Low-Medium
- San Diego desert woodrat (*Neotoma lepida intermedia*)SSC
- Pocketed free-tailed bat (*Nyctinomops femorosaccus*)SSC, WBWG Medium
- Big free-tailed bat (*Nyctinomops macrotis*)SSC, WBWG Medium-High

- American badger (*Taxidea taxus*)SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE EAST SAN GABRIEL VALLEY SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	This SEA contains various alliances of coastal sage scrub that are found in scattered patches over hillside habitat,which support a core population of the federally-threatened coastal California gnatcatcher. The gnatcatcher population has been slowly increasing, as recently observed in coastal sage scrub at two locations in the area, Bonelli Park and Buzzard Peak. There are an estimated 10 and 15 pairs of gnatcatchers in this population. The SEA also has a population of breeding coastal cactus wren. The rare multi-stemmed dudleya has its northernmost population in Bonelli Park.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	Several plant communities within this SEA are ~~CDFG~~CDFW highest priority communities due to their restricted distribution in the Southern California region. These communities include walnut woodlands, which are scattered throughout the SEA; oak riparian woodland, which is excellent within the Walnut Creek drainage; isolated stands of willow woodland along many of the drainages; freshwater marsh and open water in association with Puddingstone Reservoir; and coastal sage scrub in scattered patches over hillsides. Coastal sage scrub serves as the habitat for the coastal California gnatcatcher, which has been slowly increasing in Bonelli Park and Buzzard Peak. These areas also have a population of breeding cactus wren. The rare multi-stemmed dudleya has its northernmost population in Bonelli Park.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Met	All of the plant communities and habitats indicated as restricted in distribution on a regional basis, are also restricted in distribution within the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	Any relatively large body of water with pockets of natural lakeside vegetation along its shoreline potentially meets this criterion, particularly within the context of an arid to semi-arid environment that is characteristic of the County. Although subjected to boating activities and shoreline recreational use, Puddingstone Reservoir serves as an important habitat for migrating water fowl and water birds, which is evident in the high diversity of birds recorded at

			the Bonelli Park over the past several years. The natural areas of the east San Gabriel Valley serve as a migration and habitat connection between the San Gabriel Mountains and the Puente Hills.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	Bonelli Park contains a population of the rare many-stemmed dudleya, which is at the northern limit of its range. Most of the species is found in the Peninsular Ranges in Orange County. The coastal California gnatcatchers are in the northern extent of their range here, are clearly at an extreme in physical/geographical limitations, and may represent unusual variation in a population or community. The SEA, therefore, meets this criterion.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	NotMet	The SEA does not contain areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.

In conclusion, the area is an SEA because it contains: A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; and E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.

Griffith Park SEA

Location

General

The Griffith Park Significant Ecological Area (SEA) is located within Griffith Park, the central park of the City of Los Angeles, situated on the extreme eastern end of the Santa Monica Mountains. The SEA is an extensive, relatively undisturbed island of natural vegetation in an urbanized, metropolitan area.It supports the coastal sage scrub, chaparral, riparian, and southern oak woodland plant communities that are typical in the interior mountain ranges of Southern California.What makes the SEA important is its geographical location.It has become an island of natural vegetation surrounded by urban and suburban development.The geographic location makes the area important for scientific study, for genetic interchange between otherwise isolated populations, and for recreation of urban residents.

The SEA is located partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles:Burbank and Hollywood.

General Boundary and Resources Description

The SEA encompasses most of Griffith Park, south of the State Route-134, and west of Interstate-5. The SEA boundary generally follows the natural area near the Griffith Park boundaries in most

cases.Isolated areas are important for preserving and documenting the geographical variability of vegetation and wildlife that formerly occurred throughout the region.They serve as reservoirs of native species that could be of scientific and economic value in the future.In addition, birds rely on these islands for areas to rest and feed along their north-south and east-west migration routes.In the case of Griffith Park, this function is made even greater than might be expected because it serves as a corridor for any gene flow and species movement that may take place between the Santa Monica and San Gabriel mountains via the Verdugo Mountains.

Beginning in the northwest corner, and proceeding eastward, the SEA follows the natural vegetation on the mountain slopes at the junction with the flood plain of the former Dark Canyon and the Los Angeles River.This area of the SEA includes the recently-acquired (2010) Cahuenga Peak, at 1820 feet, which is now the highest point of Griffith Park.Cahuenga Peak slopes have rocky outcrops, chaparral, and regenerating oak woodland and chaparral on the north-facing slopes.(This area was part of the 800 acres burned in the Griffith Park Fire of 2007.)

The Los Angeles River is channelized, but there is remnant oak riparian woodland in this area.Bordering the apartment complex on the east side of Barham Boulevard, there is a somewhat abrupt change in slope where the previous Dark Canyon Creek flowed.(Barham Boulevard was evidently constructed in this Canyon.) The SEA includes the remnant riparian coast live oak woodland (*Quercus agrifolia)*, which has many jurisdictional oak trees and in many places, the natural understory.Residents and staff at the apartments report frequent sightings of wildlife, particularly mule deer (*Odocoileus hemionus*)and coyotes (*Canis latrans*),in their parking lots, which line the Griffith Park side of the complex.On the slopes above, the chaparral of this west-facing slope grades upward into an extensive area of coastal sage scrub.The SEA includes these natural areas.From the natural areas on slopes above the junction of Barham Boulevard and Forest Lawn Boulevard, the SEA boundary continues eastward along the border of natural vegetation on the slopes above Forest Lawn Boulevard, including oak woodland in the ravines and mixed chaparral and grassland on the upper slopes.Occasionally, an ash (*Fraxinus velutina*) or Southern California black walnut (*Juglans californica*) are in these ravines, along with oak trees and other chaparral plants.

The boundary follows natural vegetation southward, away from the Los Angeles River, at the boundary of Forest Lawn Memorial Park (Forest Lawn). A slope and ridge top that have been cleared by Forest Lawn have been excluded from the SEA, but the chaparral on the east-facing side of the slope is included.From this ridge, the SEA roughly follows at the edge of the natural areas around the south side of the Forest Lawn andreturns northward on the parcel line between the Forest Lawn and Griffith Park.

From the east side of Forest Lawn, the SEA boundary includes a chaparral-covered slope that is south of Travel Town and Zoo Drive.Cooper and Mathewson (2008) describe how coastal sage scrub occurs through a broad section of the northern part of Griffith Park, from end to end with patches of the sensitive valley needlegrass grassland.From the natural area near the Interstate-5 and State Route-134 interchange, the SEA boundary swings around westward, north of the Los Angeles Zoo, and forming a lobe on the chaparral-covered slopes.This area has ravines and a gradually sloping area near Travel Town, with riparian forest that includes sycamores (*Platanus racemosa*), oaks, willows (*Salix* spp.), and mulefat (*Baccharis salicifolia*), which are easily seen along Griffith Park Drive. Travel Town is not in the SEA, but its periphery of native riparian and chaparral is included. The north-facing upper slopes have chaparral, and the south-facing upper

slopes have coastal sage scrub or grassland with chaparral plants here and there, especially elderberry (*Sambucus* spp.)Along Zoo Drive, ravines have typical chaparral of north-facing slopes.The SEA boundary continues past the Los Angeles Zoo along a road to a landfill area within Griffith Park, and goes around the landfill, forming a cherry-stem shaped area at the landfill road, and then continuing southeastward on the west side of Griffith Park Drive, excluding the Harding Municipal Golf Course.The Spring Canyon picnic area is excluded, as the understory of the sycamores and oaks is unnatural lawn, and the SEA boundary continues south along natural vegetation along Griffith Park Drive to the southern boundary of Griffith Park, near the Los Feliz offramp from the Interstate-5.A golf course practice area at the corner is excluded from the SEA.

From the southeast corner, the SEA boundary goes west along with the Griffith Park boundary at the edge of development to another golf course, which is excluded due to extensive modification of theslopes.The Greek Theater in Vermont Canyon and Griffith Park Observatory on the slope beyond are included, as the modified vegetation for each covers less than 40 acres.The SEA boundary continues west and then north with the Griffith Park boundary at the edge of development.A small quarry is excluded.The undeveloped upper Brush Canyon in Griffith Park is included. Griffith Park and SEA have oak woodland along the drainages, transitioning uphill into chaparral and then grassland on the upper slopes.Within Griffith Park, north-facing sides of rocky outcrops often have a cliffside vegetation that is characterized by multiple kinds of lichens, mosses, liverworts and other non-vascular plants along with live-forever (*Dudleya* spp.), and other flowering plants.The SEA boundary follows Griffith Park boundaries around the development in the Blackwood Canyon area.A ridge area in Griffith Park on the south side of Mulholland Drive overlook is excluded. The SEA boundary follows Griffith Park boundaries on the southern edge and then turns north after including the grassland and coastal sage scrub-covered slopes that cover the open area between the two northern arms of the Hollywood Reservoir. On the west side of the SEA, the boundaries lap west outside of Griffith Park boundaries to include the oak woodland and chaparral of the lower elevations of Cahuenga Peak in the neighborhood of Dark Canyon (Barham Boulevard) and Caguenga Pass.

Vegetation

Vegetation within the SEA is comprised of a large variety of community types.The diversity of the communities reflects the topography of the mountainous park and include coastal sage chaparral scrub, riparian and coast live oak woodland, riparian, many kinds of chaparral, grassland, and cliffside vegetation.The maintenance of the diverse vegetation mosaic and the contacts of the different vegetation types (ecotones) has been cited as one of the principal qualities of importance to maintaining biotic diversity in Griffith Park(Cooper & Mathewson, 2008).The southern slopes are affected by more moist marine weather conditions, while the northern slopes are influenced by drier inland weather conditions.In addition, the steepness of many slopes causes sharp differences in vegetation on either side of a ridge.Sensitive plant species and plant communities occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA are given below.

Chaparral:A shrub community composed of robust species.Within this SEA, a number of chaparral subcommunities are found, and differentiated by their dominant plant species.These include chamise (*Adenostoma fasciculatum*), buck brush (*Ceanothus* spp.), scrub oak (*Quercus berberidifolia*), coast live oak (*Quercus agrifolia* var. *agrifolia*) and mosaics of these depending on

mixture of species and elevation.These and other shrub species form dense vegetation covers, and grow 5 to 10 feet in height.The development of chaparral is pronounced over large hillside areas throughout the SEA.

Corresponding MCV communities:

- *Adenostoma fasciculatum* (chamise chaparral) Shrubland Alliance
- *Adenostoma fasciculatum-Salvia apiana* (chamise-white sage chaparral)Shrubland Alliance
- *Arctostaphylos glauca* (bigberry manzanita chaparral) Shrubland Alliance
- *Ceanothus greggii* [*vestitus*](cup leaf ceanothus chaparral) Shrubland Alliance
- *Ceanothus spinosus* (greenbark ceanothus chaparral) Shrubland Alliance
- *Ceanothus oliganthus* (hairy leaf ceanothus chaparral) Shrubland Alliance
- *Prunus ilicifolia* (holly leaf cherry chaparral)Shrubland Alliance
- *Rhus ovata* (sugarbush chaparral)Shrubland Alliance

Coastal Sage Chaparral Scrub: A shrubland community exhibiting less robust structure found in this SEA.This plant community is dominated by California sagebrush (*Artemisia tridentata*), California brittle bush (*Encelia californica*), white sage (*Salvia apiana*), black sage (*Salvia mellifera*), and California buckwheat (*Eriogonum fasciculatum*).Dense stands may grow three to four feet in height.Within this SEA, it is generally found in scattered patches, which are highly integrated with mixed chaparral.These are located throughout the SEA at middle elevations and on hillsides.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Dendromecon rigida* (bush poppy scrub) Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub) Shrubland Alliance
- *Opuntia littoralis* (coast prickly pear scrub) Shrubland Alliance

- *Malacothamnus fasciculatus* (bush mallow scrub) Shrubland Alliance

Coast Live Oak Woodland:A plant community dominated by *Quercus agrifolia.*Within this SEA, this community includes coast live oak, which typically grows to heights of 20 to 40 feet, and forms either closed or open tree canopies.Oak woodland is most commonly found on north-facing slopes and in drainage bottoms and often intergrades with shrub communities.Understory vegetation varies from grassland in level areas to shrubs where topography is steeper.

Corresponding MCV community:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance

Riparian Forest: Along the major drainages riparian forest is found, which typically grows along streams in bedrock-constrained, steep-sided canyons, which results in a fairly narrow riparian corridor. The specific dominant plants are not known but riparian trees such as California bay (*Umbellularia californica*), white alder (*Alnus rhombifolia*), coast live oak, western sycamore (*Platanus racemosa*) and willow (*Salix* spp.) occur.There are also a greater number of hydrophytic (moister favoring) plant species in the understory.

Corresponding MCV communities:

- *Alnus rhombifolia* (white alder groves) Forest Alliance
- *Umbellularia californica* (California bay forest) Forest Alliance
- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance
- *Platanus racemosa* (California sycamore woodlands) Woodland Alliance

Wildlife

Mammals making their home in Griffith Park include mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), common gray fox (*Urocyon cinereoargenteus*), Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), California ground squirrel (*Spermophilus beecheyi*), the non-native eastern fox squirrel (*Sciurus niger*), and house mouse (*Mus musculus*).Bobcat (*Lynx rufus*) have been observed in the northwest and eastern portions of Griffith Park, and there have been sightings of a mountain lion (*Puma concolor*) that some believe may have incorporated Griffith Park into its range.

The last survey of insects in Griffith Park was in the spring 2003, which was a year with a cool, late spring; it is not clear how that weather impacted the survey results.During that survey, the most frequently observed butterfly was the gulf fritillary (*Agraulis vanillae*), which uses ornamental passion vines as a host plant.Bumblebees and honeybees were the most abundant bee species, although carpenter bees were also observed.Sand wasps were observed along some of the hiking trails, where sandy patches are present.Scorpions, tarantulas and other spiders are commonly observed.

Amphibians observed in Griffith Park have included arboreal salamander (*Aneides lugubris*), California slender salamander (*Batrachoseps attenuatus*), Baja California chorus frog (*Pseudacris hypochondriaca*) and California toad (*Anaxyrus halophilus*).Non-native amphibians found in many

streams in Griffith Park are the American bullfrog (*Lithobates catesbeianus*) and the African clawed frog (*Xenopus laevis*).In addition to stream habitats, the Los Angeles River, on the eastern side of Griffith Park provides abundant habitat for amphibians.

Reptiles identified in Griffith Park include the Great Basin fence lizard (*Sceloporus occidentalis longipes*), western skink (*Plestiodon skiltonianus skiltonianus*), San Diego alligator lizard (*Elgaria multicarinata webbii*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), western side-blotched lizard (*Uta stansburiana elegans*), California legless lizard (*Anniella pulchra*), California striped racer (*Coluber lateralis lateralis*), red racer (*C. flagellum piceus*), California kingsnake (*Lampropeltis getula californiae*), San Bernardino ringneck snake (*Diadophis punctatus modestus*), San Diego gopher snake (*Pituophis catenifer annectens*), and southern Pacific rattlesnake (*Crotalus oreganus helleri*).

Ornithologists have identified about 200 bird species in Griffith Park, and about 150 of those are regularly seen (every year–Cooper and Mathewson 2008). Griffith Park is also an important stopover for migrating birds and provides an abundance of habitat for wintering birds.Resident birds during the 2003 survey included the acorn woodpecker (*Melanerpes formicivorus*), American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), Bewick's wren (*Thryomanes bewickii*), bushtit (*Psaltriparus minimus*), California towhee (*Melozone crissalis*), California quail (*Callipepla californica*), California thrasher (*Toxostoma redivivum*), common raven (*Corvus corax*), European starling (*Sturnus vulgaris*, non-native), great horned owl (*Bubo virginianus*) and the red-tailed hawk (*Buteo jamaicensis*).Migratory birds include the ash-throated flycatcher (*Myiarchus cinerascens*), black-chinned hummingbird (*Archilochus alexandri*), black-headed grosbeak (*Pheucticus melanocephalus*) and western wood-pewee (*Contopus sordidulus*).Aquatic species, such as herons, egrets, ducks and migrating geese are seen in the Los Angeles River as it flows by Griffith Park.These species are also observed on the golf course water features within Griffith Park.

Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

Griffith Park has become increasingly isolated from the rest of the Santa Monica Mountain Range, the Los Angeles River, the Los Angeles Basin, the San Fernando Valley, and the Verdugo Mountains (a little less than two miles to the east) because of the freeways, concrete river projects and urbanization that surround Griffith Park.Although some species have disappeared, including the ringtail (*Bassariscus astutus*), the gray fox is still seen.

River-bed vegetation is quickly returning in the Los Angeles River as sand deposits on the hard channel bottom, and re-vegetation should be encouraged. Major bird and mammal populations exist on the re-vegetated portions of the Los Angeles River.Although some stretches of the Los Angeles River may not provide suitable primary corridors, it is important to reinstate Griffith Park's connection to the Los Angeles River for the future of wildlife and plant connectivity. In the management draft for Griffith Park wildlife (Cooper and Mathewson 2008), the authors outline some of the important connections to maintain or enhance: bridges and underpasses over and under State Route-101 and culverts that feed into the Los Angeles River Channel.

Griffith Park is viewed as an important connective island for the Santa Monica Mountains to the west of State Route-101 and the Verdugo Mountains and San Gabriel Mountains to the east.Wildlife may also use the natural areas and even concrete channels of the Los Angeles River to connect to the

Tujunga Wash and Hansen Dam SEA and to the San Gabriel Mountains.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition.

Sensitive Plant Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.These communities include chamise-white sage chaparral, holly leaf cherry chaparral, California brittle bush scrub, California bay forest, and California sycamore woodlands, which occur throughout the SEA.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Braunton's milk-vetch (*Astragalus brauntonii*)FE, RPR 1B.1
- Nevin's barberry (*Berberis nevinii*)FE, SE, RPR 1B.1
- Round-leaved filaree (*California macrophylla*)RPR 1B.1
- Lewis' evening-primrose (*Camissonia lewisii*)RPR 3
- Southern tarplant (*Centromadia parryi* ssp. *australis*)RPR 1B.1

- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)FC, SE, RPR 1B.1
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*)RPR 1B.1
- Many-stemmed dudleya (*Dudleya multicaulis*)RPR 1B.2
- Palmer's grapplinghook (*Harpagonella palmeri*)RPR 4.2
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)RPR 1B.1
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*) RPR 1B.1
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*)RPR 2.2
- San Bernardino aster (*Symphyotrichum defoliatum*)RPR 1B.2
- Greata's aster (*Symphyotrichum greatae*)RPR 1B.3
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)RPR 1B.2
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2
- Vernal barley (*Hordeum intercedens*)RPR 3.2
- California Orcutt grass (*Orcuttia californica*)FE, SE, RPR 1B.1

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Gertsch's socalchemmis spider (*Socalchemmis gertschi*)~~CDFG~~CDFW Special Animals List
- Western spadefoot (*Spea hammondii*)BLMS, SSC
- Coast range newt (*Taricha torosa*)SSC
- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- Western pond turtle (*Emys marmorata*)BLMS, FSS, SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Two-striped garter snake (*Thamnophis hammondii*)BLMS, FSS, SSC
- Southwestern willow flycatcher (*Empidonax traillliextimus*)FE, FSS, SE, USBC, AWL, ABC
- Least Bell's vireo (*Vireo bellii pusillus*)FE, BCC, SE, USBC, AWL, ABC

- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Silver-haired bat (*Lasionycteris noctivagans*)WBWG Medium
- Hoary bat (*Lasiurus cinereus*)WBWG Medium
- San Diego desert woodrat (*Neotoma lepida intermedia*)SSC
- Pocketed free-tailed bat (*Nyctinomops femorosaccus*)SSC, WBWG Medium
- Big free-tailed bat (*Nyctinomops macrotis*)SSC, WBWG Medium-High
- Los Angeles pocket mouse (*Perognathus longimembris brevinasus*)FSS, SSC
- Pacific pocket mouse (*Perognathus longimembris pacificus*)FE, SSC
- American badger (*Taxidea taxus*)SSC

Regional Biological Value

The SEA meets all SEA designation criteria and supports many regional biological values.Each criterion and how it is met is described below.

Criteria Analysis of the Griffith Park SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	NotMet	No known core populations occur within this SEA.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	NotMet	No known unique or rare plant or animal species occur within this SEA that would be regionally uncommon.No rare plant habitats occur in Griffith Park. Griffith Park has extensive wild areas that are little studied according to Cooper and Mathewson 2008.Such areas could be discovered.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	NotMet	No known unique or rare plant or animal species occur within this SEA that would be particularly uncommon in the County.No rare plant habitats are known in Griffith Park. Griffith Park has extensive wild areas that are little studied according to Cooper and Mathewson 2008.Such areas could be discovered.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding,	Met	Griffith Park is the easternmost extent of the Santa Monica Mountains, and a stepping stone to the Verdugo and San Gabriel mountains, which are only two miles distant.It is a

	feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.		very important natural area for animals and plants species that go between the Santa Monica and San Gabriel mountains.Because of its large acreage, Griffith Park maintains sizable populations of biological communities, even top predators, such as bobcats.Griffith Park is teetering between becoming an island of natural habitat in a metropolis and maintaining connections to the rest of the Santa Monica Mountains to the west.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	Griffith Park is the easternmost extent of the Santa Monica Mountains, and a stepping stone to the Verdugo and San Gabriel Mountains, which are only two miles distant.It is a very important natural area for animals and plants species that go between the Santa Monica and San Gabriel mountains.Because of its large acreage, Griffith Park maintains sizable populations of biological communities, even top predators, such as bobcats. Griffith Park is teetering between becoming an island of natural habitat in a metropolis and maintaining connections to the rest of the Santa Monica Mountains to the west.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Griffith Park has extensive areas of coastal chaparral and is an island of refuge for native animals in the Santa Monica Mountains.Its mosaic of habitats includes coastal sage scrub, riparian areas, and southern oak woodland.The mosaic of habitats is especially valuable to preserve. Griffith Park is in the City of Los Angeles and protected in this respect, but no management plan preserves its natural habitat in perpetuity.

In conclusion, the area is an SEA because it contains:D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Harbor Lake Regional Park SEA

Location

General

The Harbor Lake Regional Park Significant Ecological Area (SEA) is located [within Kenneth Malloy Harbor Regional Park] in the Harbor City community of the City of Los Angeles, which is approximately 15 miles south of downtown Los Angeles and just west of the Interstate-110.The Lake is named “Machado Lake.”The SEA supports one of three remaining wetlands that once covered the southern and western areas of the Los Angeles Basin.The SEA supports significant areas of aquatic and terrestrial plant communities, which provide habitat to a variety of birds and wildlife.

The site is located in the Torrance Quadrangle of the United States Geological Survey (USGS) 7.5 Minute Map Series (USGS, 1964).

General Boundary and Resources Description

The SEA boundaries encompass the lake areas that contribute to the biological function of the Harbor Lake ecosystem.It is bordered to the north by the Pacific Coast Highway, but includes a small segment of drainage, the Wilmington Drain(“Bixby Slough”) north of Pacific Coast Highway.The slough is a secluded marsh that supports wildlife and waterfowl common to marsh areas.Thirty-five species of native birds have been observed breeding in the Wilmington Drain and a large number of interesting vagrants are recorded from this area. Following the Wilmington Drain segment, the boundary travels east along the south side of Pacific Coast Highway and south along the east boundary of Harbor Regional Park to the Harbor Park Municipal Golf Course. The SEA goes east to a parking area for the golf course.The golf course is included in the SEA to emphasize the need to keep this area green.Wildlife from the adjacent woodlands use the golf course to transit between natural areas of the park in a less-populated area.The eastern boundary of the SEA includes the greens and excludes parking areas around the periphery of the golf course.The SEA goes west along the boundary of the natural riparian woodland of the park and golf course and then southwest along the boundary of marsh habitats of the park and the golf course.At the south end of the golf course, the SEA boundary goes generally southeast along the periphery of park and developed environment, much of it along the outer southern boundary of Los Angeles Harbor College.The SEA stops at the college southern frontage paved area, then turns west along Anaheim Street with the park boundary, excludes a graded and cleared area of the park in the southwest corner, and then goes with the park boundary north along Vermont Avenue to the Pacific Coast Highway.At the Pacific Coast Highway, the SEA boundary goes with the park boundary to the Wilmington Drain.Machado Lake is chiefly bordered by native marsh vegetation of cattails, rushes, reeds, and mulefat with some invasive giant cane (*Arundo donax*) and upland native riparian forest, which primarily consists of willows. The exception to the natural vegetation is along Vermont Avenue where lawns are maintained between parking areas and the lake for public recreation and picnicking.The bird species list has over 330 species, and the area is used by migrant birds on the Pacific Flyway during the spring and fall migration periods.The SEA lies generally west of the Interstate-110.

The SEA encompasses regionally unique areas, including one of three remaining wetlands that once covered the South Bay area.The freshwater plants and animals found here are completely surrounded by residential and industrial facilities.This type of habitat has been filled, drained, and lost to development throughout most of the County.In some areas, man-made lakes and ponds have created small freshwater marshes along their edges, but this is minimal in comparison to the large expanses of freshwater marsh that were once found in the Los Angeles Basin.

Freshwater marsh habitat supports a great diversity of wildlife.Most of the bird species found here are dependent in some way on the surface moisture and vegetation, and would not be able to survive without it.It is also a habitat that supports several species of amphibians.Frogs and toads can be found here that are becoming extremely difficult to find throughout Southern California.The marsh is also an important area for migratory birds.Because Harbor Lake Regional Park and Madrona Marsh are the only habitat of this type in the southern portion of the County, they serve as small scale wildlife refuges.Waterfowl, shorebirds, marsh birds, and others can be found on the marsh in numbers during the spring and fall migration.

Vegetation

The SEA encompasses southern cottonwood-willow riparian forest, southern willow scrub, mulefat scrub, Venturan coastal sage chaparral scrub, "modified" coastal freshwater marsh, vernal marsh, and non-native grassland.Immediately bordering Machado Lake are emergent wetland species, such as bulrushes, cattails, and non-native water primroses (*Ludwigia peploides*).Also within the SEA are ornamental grasses, mature non-native trees, exotic invasive plant species.The coastal freshwater marsh and vernal marshes margins support limited densities of native grasses, but these do not form separate communities and are included within the vernal pool floral matrix.Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs*, in addition to other studies conducted for the specific area*.* Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA are given below.

Southern Cottonwood-Willow Riparian Forest:An open broad-leafed winter-deciduous riparian forest dominated by Fremont cottonwood (*Populus fremontii*), black willow (*Salix gooddingii*), and red willow (*S. laevigata*).This community occurs along moister sections of drainages, ponds, and lakes.

Corresponding MCV communities:

- *Populus fremontii* (Fremont cottonwood woodlands) Forest Alliance
- *Salix gooddingii* (black willow thickets) Woodland Alliance
- *Salix laevigata* (red willow thickets) Woodland Alliance

Southern Willow Scrub:A riparian community consisting of dense, broad-leafed, winter-deciduous riparian thickets occurring within and adjacent to watercourses.The dominant species of this community within the SEA are arroyo willow (*Salix lasiolepis*) with lesser amounts of mulefat (*Baccharis salicifolia*).This community occurs in along less moist portions of drainages as well as the periphery of ponds and lakes.

Corresponding MCV communities:

- *Salix exigua* (sandbar willow thickets)Shrubland Alliance
- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance

Mulefat Scrub:A thicket occurring in seasonally and intermittently flooded habitats in riparian corridors or along lake margins.

Corresponding MCV Community:

- *Baccharis salicifolia* (mulefat thicket) Shrubland Alliance

Freshwater Marsh:Develops in areas of still or slow-moving permanent freshwater.This community is

dominated by the perennial, emergent monocot cattails, which reach a height of four to five meters and often form a closed canopy.Bulrushes are dominant below the cattail canopy.Freshwater marsh is relatively uncommon; it occurs in small patches in natural or created sinks with water sources.

Corresponding MCV communities:

- *Lepidium latifolium* (perennial pepper weed patches) Semi-Natural Herbaceous Stands
- *Eleocharis macrostachya* (pale spike rush marshes) Herbaceous Alliance
- *Schoenoplectus californicus* (California bulrush marsh) Herbaceous Alliance
- *Typha* (*angustifolia*, *domingensis*, *latifolia*)(cattail marshes) Herbaceous Alliance
- *Juncus arcticus* (var. *balticus*, *mexicanus*) (Baltic and Mexican rush marshes)Herbaceous Alliance
- *Juncus effusus* (soft rush marshes) Herbaceous Alliance
- *Lemna* (*minor*) *and relatives* (duckweed blooms)ProvisionalHerbaceous Alliance

Vernal PoolSites:Occur in several different areas within the SEA where unique sub-surface conditions of shallow layers of less permeable horizons allow for seasonal accumulations of freshwater.True vernal pools, which are rare in Southern California and extremely rare in the County, form seasonally in shallow, closed basins, usually where a lens of heavy clay soil holds surface water following rainfall events.

Corresponding MCV communities:

- *Eleocharis macrostachya* (pale spike rush marshes) Herbaceous Alliance
- *Juncus arcticus* (var. *balticus*, *mexicanus*) (Baltic and Mexican rush marshes) Herbaceous Alliance
- *Juncus* (*oxymeris*, *xiphioides*)(iris-leaf rush seeps) Provisional Herbaceous Alliance

Non-Native Grassland:Consists of dominant invasive annual grasses that are primarily of Mediterranean origin.Dominant species found within this community include wild oat (*Avena fatua*), slender oat, red brome, ripgut brome (*Bromus diandrus*), and herbs such as black mustard and wild radish.

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*)Semi-Natural Herbaceous Stands
- *Brassica* (*nigra*)and other mustards Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus*, *hordeaceus*)-*Brachypodium distachyon* Semi-Natural Herbaceous Stands

- *Bromus rubens-Schismus* (*arabicus*, *barbatus*) [*Bromus madritensis*ssp.*rubens*]Semi-Natural Herbaceous Stands

- *Lolium perenne* [*Festuca perennis*] (perennial rye grass fields) Semi-Natural Herbaceous Stands

Venturan Coastal Sage Chaparral Scrub:Described as present and is characterized by the summer drought deciduous vegetation found near the Southern California coast south of Ventura County of low, mostly soft-woody shrubs with bare ground underneath and between shrubs.This community is dominated by California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), purple sage (*Salvia leucophylla*), and California brittle bush (*Encelia californica*).

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance

- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance

- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance

- *Encelia californica* (California brittle bush scrub) Shrubland Alliance

- *Salvia mellifera* (black sage scrub) Shrubland Alliance

- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance

- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub) Shrubland Alliance

Wildlife

Wildlife diversity and abundance within the SEA is moderate, commensurate with the relative homogeneity of the natural open space habitat types.Wildlife within much of the SEA is comprised of species typically occurring within freshwater and vernal pools.Birds of prey frequently forage over the pools and open grasslands, which form following the seasonal drying of the surface water.The Harbor Lake Regional Park vernal pools provide rare surface water habitat for wildlife in an otherwise developed region, and the ponds attract moderate numbers and diversity of migratory waterfowl.A number of local wildlife species are strictly limited to seasonal pool habitats.The vernal pool system in the Harbor Lake and also those in nearby Madrona Marsh Preserve SEA constitute the only local functional ecosystems of this unique type for wildlife species.

Freshwater marsh habitat supports a great diversity of wildlife.Most of the bird species found here are dependent in some way on the surface moisture and vegetation, and would not be able to survive without it.It is also a habitat that supports several species of amphibians.Frogs and toads can be found here that are becoming extremely difficult to find throughout Southern California.The marsh is also an important area for migratory birds.Because Harbor Lake Regional Park and Madrona Marsh are the only habitat of this type in the southern portion of the County, they serve as small-scale wildlife

refuges.Waterfowl, shorebirds, marsh birds, and others can be found on the marsh in numbers during the spring and fall migration.

Coastal sage chaparral scrub habitats with persistent surface hydrology during the breeding season supports abundant populations of Baja California chorus frog (*Pseudacris hypochondriaca*), California toad (*Anaxyrus halophillus*), and western spadefoot (*Spea hammondii*).At least two species of salamander may also be present within more mesic portions of the surrounding canyons and chaparral.

Bird diversity within the SEA is related to habitat opportunities for year-round residents, seasonal residents, migrating raptors and song birds.Open coastal sage chaparral scrub hosts a suite of birds that are typical of such sites at lower elevations over most of the coastal slopes of Southern California.The most productive sites for resident coastal sage chaparral scrub birds are around riparian and freshwater systems, which attract large numbers of migrants during the spring and fall.The vernal pools attract moderate numbers of migrating waders and waterfowl, and provide important winter foraging areas for resident and migratory birds of prey.Birds of prey typically observed around vernal pools include red-tailed hawk and American kestrel.

Wildlife species previously recorded, as well as those expected to occur, within the study area are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEAs*.Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

The vernal pools situated within this SEA serve as isolated, high-quality habitat and linkage resource for migratory waterfowl.The vernal pools teem with arthropod and amphibian activity, and provide essential feeding grounds for long-distance migrants, as well as for resident species of reptiles, birds and mammals.The SEA does not lie within any identified terrestrial movement routes for wildlife.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition.

The SEA is configured to encompass the regionally significant vernal pools and coastal sage chaparral scrub watershed. Changes to the classification system in some cases divides plant communities into many possible vegetation alliances, not all of which may be considered sensitive. For the purposes here previously listed communities with a least one sensitive alliance in the new format have been listed.

Sensitive Plant Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.The SEA is configured to encompass regionally significant communities, which include Fremont cottonwood woodlands, black willow thickets, iris-leaf rush seeps, California brittle bush scrub, and all vernal pool sites.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Aphanisma (*Aphanisma blitoides*)RPR 1B.1
- Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*)FE, SE, RPR 1B.1
- Coulter's saltbush (*Atriplex coulteri*)RPR 1B.2
- South Coast saltscale (*Atriplex pacifica*)RPR 1B.2
- Parish's brittlescale (*Atriplex parishii*)RPR 1B.1
- Davidson's saltscale (*Atriplex serenana* var. *davidsonii*)RPR 1B.2
- Southern tarplant (*Centromadia parryi* ssp. *australis*)RPR 1B.1
- Salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*)FE, SE, RPR 1B.2
- Mud nama (*Nama stenocarpum*)RPR 2.2
- Moran’s navarretia (*Navarretia fossalis*)FT, RPR 1B.1
- Prostrate vernal pool navarretia (*Navarretia prostrata*)RPR 1B.1
- Estuary seablite (*Suaeda esteroa*)RPR 1B.2
- San Bernardino aster (*Symphyotrichum defoliatum*)RPR 1B.2

- Vernal barley (*Hordeum intercedens*)RPR 3.2
- California Orcutt grass (*Orcuttia californica*)FE, SE, RPR 1B.1

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Vernal pool fairy shrimp (*Branchinecta lynchi*)FT
- San Diego fairy shrimp (*Branchinecta sandiegonensis*)FE
- Riverside fairy shrimp (*Streptocephalus woottoni*)FE
- Mimic tryonia (*Tryonia imitator*)~~CDFG~~CDFW Special Animals List
- Monarch butterfly (*Danaus plexippus*)~~CDFG~~CDFW Special Animals List
- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- Western pond turtle (*Emys marmorata*)BLMS, FSS, SSC
- Tricolored blackbird (*Agelaius tricolor*)BCC, BLMS, SSC, USBC, AWL, ABC
- Southwestern willow flycatcher (*Empidonax traillii extimus*)FE, FSS, SE, USBC, AWL, ABC
- Belding's savannah sparrow (*Passerculus sandwichensis beldingi*)SE
- Bank swallow (*Riparia riparia*)ST
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Silver-haired bat (*Lasionycteris noctivagans*)WBWG Medium
- South coast marsh vole (*Microtus californicus stephensi*)SSC
- Pocketed free-tailed bat (*Nyctinomops femorosaccus*)SSC, WBWG Medium
- Big free-tailed bat (*Nyctinomops macrotis*)SSC, WBWG Medium-High
- Pacific pocket mouse (*Perognathus longimembris pacificus*)FE, SSC
- Southern California saltmarsh shrew (*Sorex ornatus salicornicus*)SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE HARBOR LAKE REGIONAL PARK SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	NotMet	This SEA does not contain habitat that supports a core population
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	SEA supports a sizeable lake with a freshwater marsh along its northern, eastern and southern shores and the Bixby Slough, habitats that once covered the South Bay area.This type of habitat has been filled, drained, and lost to development throughout most of Southern California.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Met	Harbor Lake Regional Park is one of three remaining wetlands with freshwater marsh in the County.(The others are Madrona Marsh and recreated Ballona Freshwater Marsh, which are also in SEAs.) This type of habitat once covered much of the southern and western Los Angeles Basin area, and supports several species of amphibians including frogs and toads that are becoming rare throughout Southern California.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or inCounty.	Met	Harbor Lake Regional Park and its marshes is an important area for migratory birds.The list of number of bird species seen has over 330 species.Freshwater marshes are important breeding areas for a number of birds and amphibian species.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The Harbor Lake freshwater marsh has attracted considerable attention from the academic and scientific communities, and the resources of the area are well documented and continue to be studied.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The freshwater marsh is a good example of the freshwater marshes that used to occur along the fault lines of the Los Angeles Basin.

In conclusion, the area is an SEA because it contains:B-C) a sizeable lake with a freshwater marsh along its eastern shore and the Bixby Slough, habitats that once covered the South Bay area.This type of habitat has been filled, drained, and lost to development throughout most of Southern California and the County.Three of these habitats remain in the County;D) the Harbor Lake Regional Park is habitat that serves as concentrated breeding, feeding, resting, and migrating grounds and is limited in availability both regionally and in the County;E)the Harbor Lake freshwater marsh has attracted considerable attention from the academic and scientific communities, and the resources of the area are well documented and continue to be studied;and F) the freshwater marsh is a good example of thefreshwater marshes that used to occur along the fault lines of the Los Angeles Basin.

Joshua Tree Woodlands SEA

Location

General

The Joshua Tree Woodlands Significant Ecological Area (SEA) is located in the western portion of the Antelope Valley west and northwest of the Antelope Valley California Poppy Reserve in an unincorporated area of the County.This SEA encompasses many of the remaining old-growth stands of Joshua trees (*Yucca brevifolia*) on the west side of the Antelope Valley.Joshua tree woodland is a complex biological community of the gradual slopes of higher elevation desert areasthat once covered much of this part of the Antelope Valley around the Antelope Wash.Joshua trees only occur within the Mojave Desert, and the County population is the western extreme location for the species.

Because Joshua trees live in areas that are easily developed for residences and agriculture, this habitat has become very fragmented in the County.The SEA consists of eight separate units, seven of which are in close proximity to each other between the Kern-Los Angeles County line to the north, and the California Aqueduct and Fairmont Butte to the south. The eighth unit is in an arroyo on the north side of the principal western ridgeline of Liebre Mountain, which is near the furthest western extent of Joshua tree woodland in Southern California.This woodland is located partially within the Angeles National Forest, and east and adjacent to the Interstate-5. The eighth unit is bordered on three sides by the San Andreas SEA.

All of the SEA except unit 8 is designated as the Antelope Valley Globally Important Bird Area (IBA) by the California Audubon.This part of the Antelope Valley is very important as a resource area that supports spring and fall migration of birds, from the small passerines to the larger raptors, such as the state-threatened Swainson's hawk (*Buteo swainsoni*) and turkey vultures (*Cathartes aura*).The Joshua tree woodland is a very important resource to these migrations by supplying perches and food for these animals on their journeys.The SEA is near the San Andreas SEA, the Antelope Valley California Poppy Reserve, the Arthur B. Ripley Desert Woodland State Park, and the County George F. Bones Desert Pines Wildlife Reserve; however, many of these areas are not contiguous with one another nor with the SEA. Unit 2 ofthe SEA includes much of the Arthur B. Ripley Desert Woodland State Park. Unit 8 of theSEA is contiguous with the San Andreas SEA.

Fragmentation is a concern because the Joshua trees depend on a small moth for reproduction.Only two species of moth can successfully pollinate Joshua trees, and in the SEA, there is only the yucca moth (*Tegeticula synthetica*).The moth may have limited dispersal abilities, and the Joshua trees cannot reproduce from seeds without pollination from this particular moth.Cross pollination is regarded as essential to a species' genetic diversity, which is essential to adaptation to environmental change.

The Joshua trees in the seven units have the growth form of the lower elevation woodlands of the flatter areas, and somewhat spaced from one another and less clumped.The Joshua trees in the eighth unit have a growth form that is more common in the hilly areas, where the individuals sprout from connected rhizomes and are clumped.Many times, these clumps are clones, with individuals all sharing the same genetic identity.

The SEA is located at least partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles:Neenach School, Fairmont Butte, Black Mountain, and Lebec.

General Boundary and Resources Description

The SEA is composed of eight units.The overall boundaries are as follows: The western boundary for units 1-7 terminates at 220th Street West (the border between Ranges 15W and 16W).The eastern boundary is 145th Street West.The northern boundary is on Avenue A at the Kern-Los AngelesCountyline.The southern boundary straddles the California Aqueduct, touches the Los Angeles Aqueduct, and is approximately on Avenue F.The southernmost area is located close to the foothills of the western San Gabriel Mountains.

Unit 1: The northernmost unit is bounded by Avenue A on the Kern-Los Angeles County line on the north between 200th Street West and approximately on 218th Street West.It extends irregularly to the south along a desert wash contour, about a 0.7 mile at its greatest extent.The current southern boundary is determined by agricultural clearing.This unit has a Joshua tree woodland with many shrub components of the biological community intact, including a floor covered by the wildflower goldfields (*Lasthenia glabrata*) in the spring.

Unit 2: Another unit is located between Avenue C to the north and Avenue F to the south (straddling part of State Route-138 on Avenue D and part of Lancaster Road on Avenue E), and east to west from about 200th Street to about 220th Street West. Clearance in various parcel units accounts for this unit's irregular shape. Agricultural clearing on both sides of the Antelope Wash has separated this unit from unit 1 to the north. The intervening area is a broad wash plain with rich alluvial soils. The former agricultural fields may now become fields of photovoltaic panels to generate renewable energy.This unit has a southern square mile that straddles the California Aqueduct and touches the Los Angeles Aqueduct at the base of the San Gabriel Mountains.In the northern area, this unit has old-growth Joshua tree woodlands on a rocky ridge that grades into stands of Joshua trees and woodland that includes California junipers (*Juniperus californica*) in flatter areas toward the south.The southern and eastern parts of this unit overlap with much of the Arthur B. Ripley Desert Woodland State Park.The California Aqueduct is open in this area and is an important resource for bird migration along the desert slopes of the western San Gabriel Mountains, particularly waterfowl.The Los Angeles Aqueduct is generally in concrete pipe for most of its extent, and in this area, is covered by a berm and road.A colony of burrowing owls (*Athene cunicularia*), which is a state species of special concern, was discovered during surveys for an adjacent photovoltaic panel development, and probably other colonies or individuals of the owl live within this unit.

Unit 3: Another unit is located between Avenue D to the north and Avenue E to the south, and between 190th Street and 195th Street West.It is on the broad outwash alluvial area of Kings Canyon and adjacent drainages.This outwash area is somewhat blocked by the aqueducts, but both aqueducts are provided with underpass channels for outflow of the canyons onto the desert floor.The SEA includes a central cleared area that is regenerating the Joshua tree woodland and a residence with less than 40 acres cleared.The area next to Avenue D that has been cleared of Joshua trees is not included.

Unit 4: The square mile between Avenue C and Avenue D, and between 180th Street and 190th Street West has a good stand of Joshua tree and juniper woodland.This is also in the Kings Canyon alluvial wash area.There is a known area of Joshua tree regeneration to the east that is not included in the SEA.

Unit 5: The quarter square mile between Avenue C-5 and Avenue E, and between 180th Street and 185th Street West, is also on the Kings Canyon alluvial wash area and has a good stand of Joshua

tree and juniper woodland.

Units 6: An area of a little over one-eighth square mile is located at the corners of both units 4 and 5. It is between Avenues D and E and between 180th Street and what would be 174th Street West. This is also in the Kings Canyon alluvial wash area and has a good stand of Joshua tree and juniper woodland.

Unit 7: A large irregular unit is located roughly between Avenue B, Avenue C5, 145th Street and 180th Street West.It has an extensive area of Joshua tree-juniper woodland that grades into stands of Joshua trees towards the east.There is a known area of Joshua tree regeneration in former agricultural fields between 160thStreet West and 170thStreet West that is not included in the SEA.The alluvial wash in the SEA is a combined area of outflow from Kings Canyon, unnamed canyons, and Broad Canyon.

Unit 8: The eighth unit is in an arroyo on the north side of the principal western ridgeline of Liebre Mountain, which is near the furthest western extent of Joshua tree woodland in Southern California.This woodland is located partially within the Angeles National Forest. It is east and adjacent to the Interstate-5.The eighth unit is bordered on three sides by the San Andreas SEA.This woodland has the clonal growth that is typical of Joshua trees in hilly areas.

The SEA is located primarily on the western Antelope Valley floor between the Tehachapi Mountains and the western San Gabriel Mountains.The topography of the SEA is extremely flat with the land sloping less than 200 feet in approximately five miles.The location and orientation of the SEA represents a matrix of remnant stands of Joshua tree woodland among a patchwork of disturbed areas.Nearly all of the land within the SEA is undisturbed and vegetated.Most of the land surrounding the SEA is disturbed by agricultural use, and also has some scattered rural residences. TheSEA is entirely withiin the unincorporated area of the County.

Vegetation

Vegetation within the SEA is limited to a few communities with relatively few species.However, the dominant community, the Joshua tree woodland, is in good condition throughout most of the SEA and includes many mature stands.Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.*Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA, including desert scrub, non-native grassland, Joshua tree woodland, juniper woodland, and disturbed are given below.

Desert Scrub:A moderately tall, fairly open shrubland with several species contributing to the canopy.Dominants often include Great Basin sagebrush, antelope bush, saltbush, and/or rabbitbrush, with several perennial grasses dispersed between the shrubs.Within the SEA, this community intergrades with Joshua tree woodlands.

Corresponding MCV communities:

- *Artemisia tridentata* (big sagebrush) Shrubland Alliance

- *Acacia greggii* (catclaw acacia thorn scrub) Shrubland Alliance
- *Ericameria nauseosa* (rubber rabbitbrush scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub)Shrubland Alliance
- *Ephedra californica* (California joint fir scrub) Shrubland Alliance
- *Yucca brevifolia* (Joshua tree woodland) Woodland Alliance
- *Grayia spinosa* (spiny hop sage scrub) Shrubland Alliance
- *Gutierrezia sarothrae* (broom snake weed scrub) Provisional Shrubland Alliance
- *Purshia tridentata* (bitter bush scrub) Shrubland Alliance

Grassland Communities:Consist of low, herbaceous vegetation that are dominated by grasses, but generally also harbor native forbs and bulbs, as well as naturalized annual forbs.Grasslands within the SEA consist of non-native grasslands alone.Non-native grassland consists of dominant invasive annual grasses that are primarily of Mediterranean origin.Dominant species found within this community include slender oats, wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis* ssp. *rubens*), goldentop (*Lamarckia aurea*), *Schismus*, and wild mustard.Non-native grasslands are located in small patches that interming with Joshua tree woodland throughout the SEA.

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*) (wild oats grasslands) Semi-Natural Herbaceous Stands
- *Brassica* (*nigra*) and other Mustards (upland mustards) Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus*,*hordeaceus*)-*Brachypodium distachyon* (annual brome grasslands)Semi-Natural Herbaceous Stands
- *Bromus rubens*-*Schismus* (*arabicus*, *barbatus*) ([*Bromus madritensis* ssp. *rubens*] red brome or Mediterranean grass grasslands)Semi-Natural Herbaceous Stands
- *Centaurea* (*solstitialis*, *melitensis*)(yellow star-thistle fields) Semi-Natural Herbaceous Stands

Joshua Tree Woodland:An open woodland with Joshua tree (*Yucca brevifolia*), usually as the only arborescent species with numerous smaller shrub species interspersed between.Shrub species include Great Basin sagebrush, antelope bush, saltbush, rabbit brush, and creosote bush.Joshua tree woodland occupies approximately 95 percent of the SEA.

Corresponding MCV communities:

- *Yucca brevifolia* (Joshua tree woodland) Woodland Alliance

Juniper Woodland:An open woodland dominated by California juniper (*Juniperus californicus*), with

an understory that is typical of desert scrub.This community is dominant in a few areas within the SEA, but is usually loosely scattered within the Joshua tree woodland.

Corresponding MCV communities:

- *Juniperus californica* (California juniper woodland) Woodland Alliance

Disturbed or Barren Areas:Areas that either completely lack vegetation or are dominated by ruderal species.Ruderal vegetation typically found within the SEA includes non-native grasses and "weedy" herbaceous species, native and non-native, including doveweed (*Croton setigerus*), mustards, telegraph weed (*Heterotheca grandiflora*), Russian-thistle (*Salsola tragus*), dock (*Rumex* spp.), yellow star-thistle (*Centaurea solstitialis*), Australian saltbush (*Atriplex semibaccata*), and cocklebur (*Xanthium strumarium*).Disturbed areas occur throughout the SEA around active agriculture and residential developments, along paved roads, dirt access roads, and other similarly disturbed areas.

Corresponding MCV communities:

None at this time.

Wildlife

Wildlife populations within the SEA reflect somewhat lower diversity and abundance for the habitat types present due to the small size of the SEA areas, the homogeneity of the topography and habitat, and influences of edge effect from surrounding agricultural land uses.An assessment of invertebrate populations is made difficult due to the lack of data, but the SEA is sure to include more common species in fair numbers.Amphibian populations are generally scarce in desert communities and no riparian habitat is available within the SEA.Many essential reptilian habitat characteristics such as open habitats that allow free movement and high visibility and small mammal burrows for cover and escape from predators and extreme weather are present within the SEA.These characteristics, as well as the availability of fallen and decomposing woody material, are likely to support a wide variety of reptilian species. The viviparous desert night lizard (*Xantusia vigilis*) occurs almost exclusively in association with Joshua tree debris and debris of other desert floor yuccas.

The scrubland, woodland, and grassland habitats in the SEA provide foraging and cover habitat for year-round resident and seasonal resident song birds.In addition, the SEA encompasses abundant raptor foraging, perching, and nesting habitat.The combination of these resources provide for a diversity of bird species.

Mammal populations are suggested to also reflect the generally disturbed environs influencing this SEA.Small mammals are expected to be uneven in their diversity with more adaptive species and introduced European species being in high numbers compared to others.Medium sized mammal populations are expected to exhibit the same characteristics.Large mammals are largely absent on a resident basis.

All wildlife species previously recorded, as well as those expected to occur, within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEAs*.Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

Wildlife movement within the SEA is possibly limited to local movement, but large-scale movement across the Antelope Valley floor is probably much facilitated by the Joshua tree habitat as island-like stepping stones. Typically in burned-over areas, animal paths tend to orient toward the Joshua tree habitat.Birds, and possibly bats, and other aerial organisms that use the migration corridor along the desert side of the San Gabriel Mountains probably use the woodland in the SEA for resting and feeding.Animals foraging within the SEA are unlikely to occur in concentrated numbers due to the heterogeneity of the topography and habitat of the SEA.However, local movement to and from the different SEA areas, as well as to and from the San Gabriel Mountains and the Tehachapi Mountains may be restricted due to the disturbed nature of the Antelope Valley floor.Wildlife movement is likely to converge in areas where movement is still possible, which produces concentrated movement areas or "bottlenecks."

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition.

Sensitive Plant Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.These include California joint fir scrub, Joshua tree woodland, spiny hop sage scrub, broom snake weed scrub, and bitter bush scrub.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

In addition, ~~CDFG~~CDFW is concerned with the status of California juniper woodland within the Antelope Valley, and this community is therefore considered sensitive within the County.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Peirson's morning-glory (*Calystegia peirsonii*)RPR 4.2
- Clokey's cryptantha (*Cryptantha clokeyi*)RPR 1B.2
- Short joint beavertail (*Opuntia basilaris* var. *brachyclada*)RPR 1B.2

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Tricolored blackbird (*Agelaius tricolor*)BCC, BLMS, SSC, USBC, AWL, ABC
- Burrowing owl (*Athene cunicularia*)BCC, BLMS, SSC
- Ferruginous hawk (*Buteo regalis*)BCC, BLMS, ~~CDFG~~CDFW Watch List, AWL, LAA
- Swainson's hawk (*Buteo swainsoni*)BCC, FSS, ST, USBC, AWL, ABC
- Mountain plover (*Charadrius montanus*)BCC, SSC, USBC, AWL, ABC
- Merlin (*Falco columbarius*)~~CDFG~~CDFW Watch List
- Prairie falcon (*Falco mexicanus*)BCC, ~~CDFG~~CDFW Watch List, LAA
- American peregrine falcon (*Falco peregrinus anatum*)BCC, FSS, SE, CDF, ~~CDFG~~CDFW Fully Protected, AWL, ABC
- California condor (*Gymnogyps californianus*)FE, SE, CDF, ~~CDFG~~CDFW Fully Protected, USBC, AWL, ABC
- Loggerhead shrike (*Lanius ludovicianus*)BCC, SSC, LAA
- Le Conte's thrasher (*Toxostoma lecontei*)BCC, BLMS, SSC, USBC, AWL, ABC, LAA
- Hoary bat (*Lasiurus cinereus*)WBWG Medium
- Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*)FSS, SSC
- American badger (*Taxidea taxus*)SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE JOSHUA TREE WOODLANDS SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	NotMet	Although there are several listed species that occur within the SEA, this criterion is not met due to the lack of known core population areas.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The SEA contains large patches of undisturbed Joshua tree woodland habitat, which has become increasingly rare in the region.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Met	As stated above, Joshua tree woodlands have become rare in the region, and are even more rare in the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The habitat within the SEA has been studied for how it may serve as a concentrated breeding, feeding, resting, or migrating ground for any species.Some cross-desert migratory routes depend, in part, on the cover and habitat of the Joshua tree woodland.The units 1-7 of the SEA on the Antelope Valley floor are in a globally IBA, known as a bird migration route.The Joshua tree woodland is an important component of resources that supports this migration.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	Due to the scarcity of Joshua tree woodland, specimens of the quality found in the SEA are important to science and have become living laboratories.The SEA contains the most westerly extent of this habitat type.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The Joshua tree woodland contained within the SEA is an excellent example of this community type.

In conclusion, the area is an SEA because it contains:B-C) Joshua tree woodland, a rare community both regionally and within the County; D) habitat important to breeding, feeding, and migration; E) the geographic limit of Joshua tree woodland; and F) an excellent undisturbed example of Joshua tree woodland.

Madrona Marsh Preserve SEA

Location

General

The Madrona Marsh Preserve Significant Ecological Area (SEA) lies on the northeast corner of

Madrona Avenue and Sepulveda Boulevard, within the City of Torrance.The SEA boundaries encompass the natural part of the Madrona Marsh Preserve, which is a remnant of one of the last natural vernal wetlands in the County.Vernal marshes fill in the rainy season (winter and spring in our area) and dry completely by the end of summer.They are heavily used by migrant birds in the spring, and in the fall if rains are early.They usually have other resident flora and fauna that are specially adapted to the seasonal cycle of wetting and gradual complete dessication.

The SEA is located within the Torrance United States Geological Survey (USGS) 7.5' California Quadrangle.

General Boundary and Resources Description

The SEA boundaries generally follow the Madrona Marsh Preserve boundary, which is surrounded by urban development.The Madrona Marsh Preserve is a park of the City of Torrance that is situated to the west of Maple Avenue, north of West Sepulveda Boulevard, east of Madrona Avenue and directly south of Plaza Del Amo.The Madrona Marsh Nature Center has offices and visitor activities to the north of Plaza Del Amo.The Nature Center supports an active volunteer and educational program for natural areas in this part of the Los Angeles Basin.

The SEA supports one of three remaining freshwater wetlands that once covered much ofthe southern and western Los Angeles Basin area.In the lowland are vernal marshes and an alkaline margin, and the upland supports a back dune system and vernal pools.

The freshwater plants and animals found here are completely surrounded by residential development and industrial facilities.This type of habitat has been filled, drained, and lost to development throughout most of the County.In some areas, man-made lakes and ponds have created small freshwater marshes along their edges, but this is minimal in comparison to the large expanses of freshwater marsh that were once found in the Los Angeles Basin.

Freshwater marsh habitat supports a great diversity of wildlife.Most of the bird species are dependent in some way on the surface moisture and vegetation, and would not be able to survive without it.It is also a habitat that supports several species of amphibians.Frogs and toads can be found here that are becoming extremely difficult to find throughout Southern California.The marsh is also an important area for migratory birds.Over 150 bird species have been recorded as using Madrona Marsh.Because the remnant freshwater marshes like Madrona Marsh are the only habitat of this type in southern portion of the County, they serve as miniature wildlife refuges.Kenneth Malloy Harbor Regional Park (Harbor Lake Regional Park SEA) and Ballona Freshwater Marsh (Ballona Wetlands CRA) are the two other freshwater marshes in this area.Waterfowl, shorebirds, marsh birds, and others can be found on the marsh in numbers during the spring and fall migration.

Vegetation

The SEA encompasses formations of vernal pool aquatics and emergent species, alkaline marsh and coastal bluff and dune scrub.The vernal pool margins support limited densities of native grasses, but these do not form separate communities and are included within the vernal pool floral matrix.Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA are given

below.

Vernal Marsh:Develops in areas of still or slow-moving freshwater for 6 to 11 months of the year.This community is dominated by the perennial, emergent cattails (*Typha* spp.), which reach a height of four to five meters and often form a closed canopy.Bulrushes (*Schoenoplectus* spp.) are dominant below the cattail canopy.Vernal marsh is relatively uncommon; it occurs in small patches in natural or created sinks with water sources.

Corresponding MCV communities:

- *Phragmites australis* (common reed marshes) HerbaceousAlliance and Semi-Natural Stands
- *Lepidium latifolium* (perennial pepper weed patches) Semi-Natural Herbaceous Stands
- *Eleocharis macrostachya* (pale spike rush marshes) Herbaceous Alliance
- *Schoenoplectus californicus* (California bulrush marsh) Herbaceous Alliance
- *Typha* (*angustifolia, domingensis, latifolia*)(cattail marshes) Herbaceous Alliance
- *Sarcocornia* [*Salicornia*] *pacifica* (*Salicornia depressa*)(pickleweed mats) Herbaceous Alliance
- *Juncus articus* (var. *balticus*, *mexicanus*) [*Juncus balticus* ssp. *ater, J. mexicanus*] (Baltic and Mexican rush marshes)Herbaceous Alliance
- *Juncus effusus* (soft rush marshes) Herbaceous Alliance
- *Lemna* (*minor*) and relatives (duckweed blooms) Provisional Herbaceous Alliance

Vernal PoolSites:Occur in several different areas within the SEA where unique sub-surface conditions of shallow layers of less permeable horizons allow for seasonal accumulations of freshwater.True vernal pools, which are rare in Southern California and extremely rare in the County, form seasonally in shallow, closed basins, usually where a lens of heavy clay soil holds surface water following rainfall events.

Corresponding MCV communities:

- *Eleocharis macrostachya* (pale spike rush marshes) Herbaceous Alliance
- *Juncus arcticus* (var. *balticus*, *mexicanus*) [*Juncus balticus* ssp. *ater, J. mexicanus*] (Baltic and Mexican rush marshes) Herbaceous Alliance
- *Juncus* (*oxymeris, xiphioides*)(iris-leaf rush seeps) Provisional Herbaceous Alliance

Alkali Marsh:Found on the margins of the vernal pools and is similar to the freshwater marsh, but with more salt-tolerant hydrophytes present.Species associated with this community include saltgrass (*Distichlis spicata*), mulefat (*Baccharis salicifolia*), alkali mallow (*Malvella leprosa*), toadrush (*Juncus bufonis*), spikeweed (*Centromadia pungens ssp. pungens*), cotton batting (*Gnaphalium stramineum*), and alkali heliotrope (*Heliotropium curassavicum var. oculatum*).

Corresponding MCV communities:

- *Distichlis spicata* (salt grass flats) Herbaceous Alliance
- *Spartina foliosa* (California cordgrass marsh) Herbaceous Alliance
- *Arthrocnemum subterminale* (Parish's glasswort patches) Herbaceous Alliance
- *Atriplex lentiformis* (quailbush scrub) Shrubland Alliance

Coastal Bluff and Dune Scrub:Here is a remnant of the El Segundo Dune System that occupied coastal areas along much of the Santa Monica Bay.The system consists of fine, sandy soil that dries rapidly.Plants typical of the dune scrub include dune buckwheat (*Eriogonum parvifolium*), rattle pod (*Astragalus trichopodus var. lonchus*), bladderpod (*Peritoma arborea*), deer weed (*Acmispon glaber*), sawtooth goldenbush (*Hazardia aquarrosa*), and California sunflower (*Helianthus californicus*).

Corresponding MCV communities:

- *Baccharis pilularis* (coyote brush scrub) Shrubland Alliance
- *Lupinus arboreus* (yellow bush lupine scrub) Shrubland Alliance and Semi-Natural Shrubland Stands
- *Lupinus chamissonis-Ericameria ericoides* (silver dune lupine–mock heather scrub) Shrubland Alliance

Wildlife

Wildlife diversity and abundance within the SEA is moderate, commensurate with the relative homogeneity of the natural open space habitat types.Wildlife within much of the SEA is comprised of species that typically occur within freshwater marsh and vernal pools.Birds of prey frequently forage over the pools and open grasslands, which form following the seasonal drying of the surface water.The Madrona Marsh vernal pools provide rare surface water habitat for wildlife in an otherwise developed region, and the ponds attract moderate numbers and diversity of migratory waterfowl.A number of local wildlife species are strictly limited to seasonal pool habitats.The vernal pool system in the Madrona Marsh and those in nearby Harbor Lake Regional Park SEA and the Ballona Wetlands freshwater marsh constitute the only local functional ecosystems of this unique type for wildlife species.The Madrona Marsh is the only one of these freshwater wetlands that has the yearly cycle of filling in the spring and complete dessication by late summer.

Analysis of invertebrates on any particular site usually is limited by a lack of specific data, but has sufficient acreage to support healthy populations of whatever invertebrate species are present, which is probably several hundred terrestrial species.The vernal pools, when ponded, form aquatic habitats for a moderately diverse fauna of freshwater arthropods and other invertebrates, including native fairy shrimp, aquatic flies, diving beetles, water scavengers, ostracods, and snails.Amphibians generally are relatively common in the pond.Frogs and toads are frequently seen.

Madrona Marsh, nearby Kenneth Malloy Harbor Regional Park, and Ballona freshwater marsh are

the only habitats of this type in the southern portion of the County, and they serve as miniature wildlife refuges for bird species of open fresh water, waterfowl, shorebirds, marsh birds, and others can all be found on the marsh in numbers during the spring and fall migration.

Wildlife Movement

The vernal pools situated within this SEA serve as an isolated, high-quality resource providing habitat linkage for migratory waterfowl.The vernal pools teem with arthropod and amphibian activity, and provide essential feeding grounds for long-distance migrants, as well as for resident species of reptiles, birds and mammals.The ponds do not lie within any identified terrestrial movement routes for wildlife.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition.

Sensitive Plant Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.The SEA is configured to encompass regionally significant communities, which include pickleweed mats, California cordgrass marsh, Parish's glasswort patches, silver dune lupine-mock heather scrub, and all vernal pools.These communities or closely related designations are considered highest priority communities by the ~~CDFG~~CDFW, indicating that they are declining in acreage throughout their range due to land use changes.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section. Changes to the classification system in some cases divides plant communities into many possible vegetation alliances communities, not all of which may be considered sensitive.For the purposes here previously listed communities with a least one sensitive alliance in the new format have been listed.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in the

California), or .3 (not very endangered in the California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Aphanisma (*Aphanisma blitoides*)RPR 1B.1
- Ventura marsh milk-vetch (*Astragalus pycnostachyus var. lanosissimus*)FE, SE, RPR 1B.1
- Coastal dunes milk-vetch (*Astragalus tener var. titi*)FE, SE, RPR 1B.1
- Coulter's saltbush (*Atriplex coulteri*)RPR 1B.2
- South coast saltscale (*Atriplex pacifica*)RPR 1B.2
- Parish's brittlescale (*Atriplex parishii*) RPR 1B.1
- Davidson's saltscale (*Atriplex serenana var. davidsonii*)RPR 1B.2
- Southern tarplant (*Centromadia parryi ssp. australis*)RPR 1B.1
- Orcutt's pincushion (*Chaenactis glabriuscula var. orcuttiana*)RPR 1B.1
- Coastal goosefoot (*Chenopodium littoreum*)RPR 1B.2
- Salt marsh bird's-beak (*Chloropyron maritimum ssp. maritimum*)FE, SE, RPR 1B.2
- Beach spectaclepod (*Dithyrea maritima*)ST, RPR 1B.1
- Coulter's goldfields (*Lasthenia glabrata ssp. coulteri*)RPR 1B.1
- Mud nama (*Nama stenocarpum*)RPR 2.2
- Moran’s navarretia (*Navarretia fossalis*)FT, RPR 1B.1
- Prostrate vernal pool navarretia (*Navarretia prostrata*)RPR 1B.1
- Coast woolly-heads (*Nemacaulis denudata var. denudata*)RPR 1B.2
- South coast branching phacelia (*Phacelia ramosissima var. austrolitoralis*)RPR 4.2
- Brand's star phacelia (*Phacelia stellaris*)FC, RPR 1B.1
- Ballona cinquefoil (*Potentilla multijuga*)RPR 1A
- Estuary seablite (*Suaeda esteroa*)RPR 1B.2
- Vernal barley (*Hordeum intercedens*)RPR 3.2
- California Orcutt grass (*Orcuttia californica*) FE, SE, RPR 1B.1

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Mimic tryonia (*Tryonia imitator*)~~CDFG~~CDFW Special Animals List
- Belkin's dune tabanid fly (*Brennania belkini*)~~CDFG~~CDFW Special Animals List
- Busck's gallmoth (*Carolella busckana*)~~CDFG~~CDFW Special Animals List
- Sandy beach tiger beetle (*Cicindela hirticollis gravida*)~~CDFG~~CDFW Special Animals List
- Western beach tiger beetle (*Cicindela latesignata latesignata*)~~CDFG~~CDFW Special Animals List
- Senile tiger beetle (*Cicindela senilis frosti*)~~CDFG~~CDFW Special Animals List
- Globose dune beetle (*Coelus globosus*)~~CDFG~~CDFW Special Animals List
- Henne's eucosman moth (*Eucosma hennei*)~~CDFG~~CDFW Special Animals List
- El Segundo blue butterfly (*Euphilotes battoides allyni*)FE, Xerces:Critical
- Lange's El Segundo Dune weevil (*Onychobaris langei*)~~CDFG~~CDFW Special Animals List
- Wandering skipper (*Panoquina errans*)~~CDFG~~CDFW Special Animals List
- El Segundo flower-loving fly (*Rhaphiomidas terminatus terminatus*)~~CDFG~~CDFW Special Animals List
- Dorothy's El Segundo Dune weevil (*Trigonoscuta dorothea dorothea*)~~CDFG~~CDFW Special Animals List
- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- Western pond turtle (*Emys marmorata*)BLMS, FSS, SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Tricolored blackbird (*nesting colony*) (*Agelaius tricolor*)BCC, BLMS, SSC, USBC, AWL, ABC
- Western snowy plover (*Charadrius alexandrinus nivosus*)FT, BCC, SSC, ABC, AWL, USBC
- California black rail (*Laterallus jamaicensis coturniculus*)BCC, ST, ~~CDFG~~CDFW Fully Protected, USBC, AWL, ABC (*all listings include full species*)
- Belding’s savannah sparrow (*Passerculus sandwichensis beldingi*)SE

- California least tern (*Sternula antillarum browni*)FE, SE, ~~CDFG~~CDFW Fully Protected, USBC, ABC (*both listings include full species*)
- South coast marsh vole (*Microtus californicus stephensi*)SSC
- Pacific pocket mouse (*Perognathus longimembris pacificus*)FE, SSC
- Southern California saltmarsh shrew (*Sorex ornatus salicornicus*)SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met is described below.

Criteria Analysis of the Madrona Marsh Preserve SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	NotMet	Not met, although the Madrona Marsh contains vernal pools, which may harbor threatened and endangered species in a unique location for the County.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	Madrona Marsh is one of three remaining wetlands with freshwater marsh in the County.(The others are Kenneth Malloy Harbor Regional Park and the Ballona Wetlands freshwater marsh.) This type of habitat once covered the South Bay area of the Los Angeles Basin, and supports several species of amphibians and vernal pools that are becoming rare throughout Southern California.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Met	Madrona Marsh is one of three remaining wetlands with freshwater marsh in the County.This type of habitat once covered the South Bay area, and supports several species of amphibians including frogs and toads that are becoming rare throughout Southern California.In addition it has some vernal pools, which are very rare in the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	Any natural wetland like the Madrona Marsh is an important area for amphibians, which need water for their aquatic larvae to complete their life cycle.The Marsh is very important for migratory birds as a waypoint during the spring and fall migration periods.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	Because the Madrona Marsh is one of only three remnants of the formerly extensive habitat, there is much interest in the local community and at academic and scientific institutions in preserving the area and acquiring adjacent habitat currently used for gas and oil

			extraction that can be restored to marsh habitat.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The Madrona Marsh is a remnant of the freshwater marsh once prevalent in this area of the County, and it is important to recognize protection of the habitat.

In conclusion, the area is an SEA because it contains:B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, and migrating grounds, which are limited in availability in the County; E) unique habitat that is of scientific and educational value; and F) a very rare habitat of vernal marsh that has retained its unique yearly cycle.

Palos Verdes Peninsula and Coastline SEA

Location

General

The Palos Verdes Peninsula and Coastline Significant Ecological Area (SEA) is chiefly located offshore around the Palos Verdes Peninsula, but also includes terrestrial habitat in Portuguese Bend and several other disjunct drainages and ridgelines.All of the many offshore rocks within 12 nautical miles of the coast are part of the California Coastal National Monument that managed by the Bureau of Land Management in the U.S. Department of the Interior.Many endangered marine mammals use this habitat. The SEA includes the inshore part of the Point Vicente State Marine Conservation Area (SMCA) and the Abalone Cove SMCA. Most of the interior Peninsula canyons and slopes are critical habitat for the federally-threatened coastal California gnatcatcher (*Polioptila californica californica*).Many of the interior areas are also critical habitat for the federally-endangered Palos Verde blue butterfly (*Glaucopsyche lygdamus palosverdesensis*).The gnatcatcher favors the coastal sage scrub or chaparral vegetation; the butterfly favors flatter areas with grassland plants of the upper marine terraces, such as Ventura milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*), which is a principal food plant for its larvae.The gnatcatcher critical habitat covers virtually all of the terrestrial part of the SEA and extends well beyond the SEA on the Peninsula.The butterfly's critical habitat is chiefly in flatter areas of the marine terraces, but can include broader areas of the canyons.

The SEA is located at least partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles:Torrance, San Pedro, and Redondo Beach

General Boundary and Resources Description

Most of the SEA is in the nearshore marine habitat and extends from the high tide line of the beach to about one mile offshore.The designated SEA traverses along the coastline of the Palos Verdes Peninsula from Flat Rock Point at the northern end of Bluff Cove to the west end of the breakwater of Los Angeles Outer Harbor.The terrestrial part of the SEA includes several non-contiguous ravines, canyons and streambeds that are adjacent to rural residential areas.The area known as Portuguese Bend is one of the largest inland areas within the SEA.

The SEA has the inshore part of the Point Vicente SMCA, which extends from mean high tide due east-west to three nautical miles offshore. The Point Vicente SMCA is like a reserve in that no take of any kind is permitted. The western line goes due east-west off an unnamed point about a 0.4 mile north of Point Vicente. The eastern line goes due north-south off Long Point. Adjacent is the Abalone Cove SMCA, which extends from mean high tide to 3 nautical miles offshore, also due north-south. The eastern boundary of the Abalone Cove SMCA extends off Portuguese Point.

Disjunct interior parts of the SEA include: 1) Agua Amarga Canyon, which drains to Lunada Bay (critical habitat for both the Palos Verdes blue butterfly and the coastal California gnatcatcher; 2) an area of coastal sage scrub and bluffs north of Point Vicente; 3) the upper bluff area of chaparral and grassland that is on the northeast side of Pacific Coast Highway at Point Vicente; 4) the beach and cliff area south of Pacific Coast Highway at Abalone Cove, Portuguese Point, Inspiration Point and Portuguese Bend; (5) the unbuildable areas of the Portuguese Bend Landslide, which include grassland, chaparral, and canyons and surround the community of Portuguese Bend on the north side of Pacific Coast Highway, and border the southern side of the community of Rolling Hills; 6) cliffs and headland areas with coastal bluff, coastal chaparral, and grassland extending from the east side of Portuguese Bend to the City of Los Angeles border at the west end of Royal Palms Beach Park; 7) a lobe bordering the switchbacks of Palos Verdes Drive East that connects to the coast and coversthe natural cliff, bluff, and chaparral vegetation up to about one mile inland; and 8) the intertidal area on the west side of Point Fermin.

The other disjunct interior parts of the SEA are within the community of Rolling Hills,with numerous natural parts of the canyons and ridges have been too steep to develop. These are designated as part of the SEA because the native vegetation is essential for the native birds and the migrants, which include those that use the Palos Verdes Peninsula as a rest stop and those that overwinter.They include the following canyons, which are on the north side of the Palos Verdes Range crest, and drain to the Los Angeles Basin: 9) Agua Negra Canyon on the west side of Crenshaw Avenue; 10) Agua Magna Canyon; 11) Sepulveda Canyon; 12) Blackwater Canyon, including two upland forks; and 13) George F. Canyon withall three upland forks.

Finally, the remaining disjunct interior parts of the SEA are in the Miraleste district of Rancho Palos Verdes, on the east side of Palos Verdes Drive East, naturally-vegetated canyons trend eastward to the flat area of San Pedro: 14) north of Rockinghorse Road; 15) north of Colt Road; 16) north of Coral Ridge Road; 17) Miraleste Canyon (north of Miraleste Road); and 18) two branches of San Pedro Canyon (south of Via Siena and north of Via Colinta).

The SEA is formed by the Palos Verdes Range, and is characterized by marine terraces atop rough terrain that is created by the erosion of the upland areas into many canyons.The flatter areas on the marine terraces are the areas that have been developed.Unparalleled headlands, rocky shoreline, and the land-sea interface provide for a tremendous variety of biotic resources in this area.It is one of the most biologically diverse and productive regions in the County, and contains several biotic communities, including rocky intertidal, kelp bed, coastal strand, and coastal sage scrub.One small sandy beach is periodically present on an ephemeral basis at Portuguese Bend.This 10 mile stretch of coastline, between Point Fermin and Bluff Cove, is the only sizeable rocky intertidal area in the County.

The Peninsula was once an island before sediments filled the Los Angeles Basin, and it has many biological associations today that originated during the time it was insular.A number of the uncommon plants, for example, are also only known from offshore islands, and some of the bird

subspecies on the Peninsula are also only known elsewhere on the offshore islands.They are not found on the mainland except on the Palos Verdes Peninsula.

Rocky shores support a great number of species.This is primarily due to the interface of the ocean and the land, the highly diverse natural communities that both contain, and the oxygen and food-rich environment offered by this habitat.The natural features include a variety of substrates, both stable and unstable, the aeration of water and humidification of the air through wave splash, and the upwelling of nutrient-rich waters along the Southern California coast.

Subtidally, one can find representatives of every phylum of animals(major groupings, such as mollusks, echinoderms, jellyfish, etc.), many of which are not represented on land. Rocky substrates are as diverse as the intertidal areas.Sandy subtidal areas also support a great variety of species, but most are cryptic and submerge into the depths of the sand because of the high energy and unstable nature of their environment.

Kelp beds dominated by giant kelp (*Macrocystispyrifera*) are an extremely productive habitat that provides food, attachment sites, and shelter for a diverse community of invertebrates, fishes, and sea mammals.They are an important nursery habitat for juvenile fishes.Kelp beds were originally common off the Southern California coast wherever rocks were present at shallow depths.However, due to man-made and natural phenomena, this habitat has been severely diminished in the region, and is now rare in the County.A kelp bed habitat restoration program was begun in the area in the 1960s, and appears to have been successful.Kelp has been reestablished west of Point Fermin, along Abalone Cove, and offshore of Halfway Point.Smaller colonies are now reestablishing at other locations offshore of the southern coast of the Peninsula.

The coastal cliffs found in the area range in elevation from 100 to 300 feet and support coastal sage scrub and coastal strand bluff scrub.These and offshore rocks offer ideal roosting and feeding sites for numerous shorebirds, gulls, and other seabirds, including the fully-protected California brown pelican (*Pelecanus occidentalis californicus*).The area is an important stop for migrating birds as they fly along the coast or across the Santa Monica Bay.In addition, the bluff tops that are now abandoned agricultural fields are utilized by many species as wintering feeding grounds.One fully-protected species, the American peregrine falcon (*Falco peregrinus anatum*), and one very uncommon species of conservation concern, the prairie falcon (*F. mexicanus*), have been known to winter here in recent years.

The bluff tops and cliffs have been disturbed by pedestrian use, residential development, and agriculture.Only very small, isolated ravines remain in a natural state.The shoreline has suffered major biological impairment, commonly blamed on over-collection by humans and intense pollution.The health of the marine environment has been relatively poor due to human influences, such as outfalls with toxic contents, but appears to be slowly recovering.

Vegetation

Vegetation within the SEA is comprised of several terrestrial plant community types whose makeup is strongly influenced by the marine weather conditions.Coastal sage chaparral scrub occurs on the slopes, and southern willow scrub areas occur in the drainages of several isolated ravines distributed over the top of the peninsula.The immediate coast and cliffs support coastal dune and bluff scrub and coastal sage chaparral scrub.The abandoned agricultural fields and other disturbed areas that have become non-native grasslands provide raptor foraging areas with their populations of native reptiles and mammals.

Agua Amarga Canyon is the last remaining relatively undisturbed drainage on the coastal side of the Palos Verdes Peninsula.The SEA area is protected as a part of the Palos Verdes Peninsula Land Conservancy Preserves.Because of irrigation runoff, Agua Amarga has nearly perennial water.The canyon of Agua Amarga at Lunada Bay is quite spectacular, but not included in the SEA due to development on the coastal bluff adjacent to the descent to the beach.The main canyon has a complex of coastal sage scrub, chaparral, and riparian communities.Three forms of birds resident on the Peninsula that reside in Agua Amarga are insular forms of common birds: the dusky orange-crowned warbler (Vermivora celata ssp. sordida), the Channel Islands flycatcher (*Empidonax difficilis insulicola*, race of the western flycatcher), and Allen's hummingbird (*Selasphorus sasin sedentarius*).The dusky orange-crowned warbler is quite remarkable in that unlike other subspecies of the orange-crowned warbler, it is not a long-distance migrant. The federally-threatened coastal California gnatcatcher is also a resident in this canyon, and has critical habitat extending to the edge of the marine terrace bluff at the coast.Additionally, the canyon is critical habitat for the Palos Verdes blue butterfly.Vegetation also has insular forms.For example, the Catalina Island cherry (*Prunus ilicifolia* ssp. *lyonii*) and the southern island mallow (*Lavatera assurgentiflora* ssp. *glabra*) occur in the canyon.These animals and plants probably occur in all or many of the other terrestrial parts of the SEA as well.

Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.*Sensitive plant species and plant communities occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA are given below.

Coastal Bluff and Dune Scrub:Found close to the ocean where the substrate consists of fine, sandy soil that dries rapidly.In the SEA, it is limited to small sections of coastal strand and bluffs.Plants typical of the dune scrub include dune buckwheat (*Eriogonum parvifolium*), rattle pod (*Astragalus trichopodus* var. *lonchus*), bladderpod (*Peritoma arborea*), deer weed (*Acmispon glaber*), sawtooth goldenbush (*Hazardia aquarrosa*), and California sunflower (*Helianthus californicus*).

Corresponding MCV communities:

- *Baccharis pilularis* (coyote brush scrub) Shrubland Alliance
- *Lupinus arboreus* (yellow bush lupine scrub) Shrubland Alliance and Semi-Natural Shrubland Stands
- *Lupinus chamissonis-Ericameria ericoides* (silver dune lupine–mock heather scrub) Shrubland Alliance

Coastal Sage Chaparral Scrub:Consists of drought-deciduous, low, soft-leafed shrubs and herbs on gentle to steep slopes below 1,500 feet in elevation.This community is dominated by California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), purple sage (*Salvia leucophylla*), and California brittle bush (*Encelia californica*).Coastal sage scrub is distributed throughout the SEA on the slopes of the isolated areas inland from the coast and on the coastal cliffs.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Diplacus* [*Mimulus*] *aurantiacus* (bush monkeyflower scrub)Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum cinereum* (ashy buckwheat scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Hazardia squarrosa* (sawtooth golden bush scrub) Shrubland Alliance
- *Isocoma menziesii* (Menzie's golden bush scrub) Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub) Shrubland Alliance
- *Lupinus albifrons* (silver bush lupine scrub) Shrubland Alliance

Southern Willow Scrub:A riparian community consisting of dense, broad-leafed, winter-deciduous riparian thickets occurring within and adjacent to watercourses.The dominant species of this community within the SEA are willows (*Salix* spp.), with lesser amounts of mulefat (*Baccharis salicifolia*).This community occurs in segments along portions of the drainages and streambeds of isolated sites inland from the shoreline.

Corresponding MCV communities:

- *Salix exigua* (sandbar willow thickets)Shrubland Alliance
- *Salix gooddingii* (black willow thickets) Shrubland Alliance
- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance

Non-Native Grassland:Consists of dominant invasive annual grasses that are primarily of Mediterranean origin.Dominant species found within this community include wild oat (*Avena fatua*), slender oat (*Avena barbata*), red brome (*Bromus madritensis* ssp. *rubens*), ripgut brome (*Bromus diandrus*), and herbs, such as black mustard (*Brassica nigra*) and wild radish (*Raphanus raphanistrum*).Non-native grasslands are located in small to large patches throughout the SEA in previously disturbed areas, former agricultural and cattle pastures.

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*)Semi-Natural Herbaceous Stands
- *Brassica* (*nigra*)and other mustards Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus*, *hordeaceus*)-*Brachypodium distachyon* Semi-Natural Herbaceous Stands
- *Bromus rubens-Schismus* (*arabicus, barbatus*)([*Bromus madritensis*ssp.*rubens*] red brome or Mediterranean grass grasslands)Semi-Natural Herbaceous Stands
- *Lolium perenne* [*Festuca perennis*] (perennial rye grass fields) Semi-Natural Herbaceous Stands

Disturbed or Barren Areas:Areas that either completely lack vegetation or are dominated by ruderal species.Ruderal vegetation typically found within the SEA includes non-native grasses and a high proportion of weedy species, including black mustard and thistle species.Several disturbed areas are scattered throughout the SEA.

Corresponding MCV communities:

No corresponding MCV communities at this time

Intertidal and Subtidal Algal Habitats:Common in tidepools and on rocky subtidal substrate down to the macro-alga photosynthetic depth, which varies with water turbidity that is characteristic of the region.This habitat has representatives from all the phyla of algae, and it has not been characterized in the MCV manner.A common large brown alga observed at the tidepools of Point Fermin is feather-boa kelp (*Egregia menziesii*).

Community dominant plant:

- Feather-boa kelp (*Egregia menziesii*)

Surfgrass and Eelgrass Habitats:Characterized by two flowering plants that resemble grass and form dense beds on different substrates and in different conditions. Both types form highly productive habitats for unique assemblages of marine species.NOAA Fisheries and the ~~CDFG~~CDFW consider surfgrass and eelgrass as valuable habitats that should be protected.Surfgrass occurs from Mean Lower Low Water (MLLW) to about 25 foot depth on rocky substrate.Locations known to support substantial surfgrass beds include rocky points and rocky subtidal areas of canyons all along the northern border of the SEA.Eelgrass grows on soft substrate and typically occurs in bays.A form of eelgrass(thought to be *Zostera pacifica)* is found on open coast sand bottom.Eelgrass is an important habitat that supports a community of diverse species from sessile to mobile invertebrates and certain fishes, such as pipefish.

Community dominant plant:

- *Phyllospadix scouleri*, or Scouler's surf grass and *P. torrey* or Torrey's surfgrass
- *Zosterapacifica*(eelgrass)

Kelp Forest Habitat Giant Kelp Beds:Can form to a depth of approximately 99 feet in the ocean. The

kelp beds are part of a productive habitat that provide food, attachment sites and shelter for invertebrates and fishes.Giant kelp, the dominant alga of this community, is the fastest lengthening organism known, and it really thrives in nutrient-enriched waters of upwelling.It has been “clocked” at twofeet per day extension of its stipe and blades. The kelp beds are an important nursery habitat and recruitment area for juvenile fishes and invertebrates. The Fisheries National Oceanographic and Atmospheric Administration (NOAA) Fisheries, as well as the ~~CDFG~~CDFW consider kelp beds as sensitive.

Community dominant plant:

- Macrocystis pyrifera (giant kelp)

Marine Resources

The Palos Verdes coastline is a region where the upwelling of nutrient-rich waters offers a variety of habitats that supports highly productive and extremely diverse marine and coastal communities.Man-made disturbances have seriously diminished the quality and extent of unaffected marine habitats.Today, the SEA possesses limited areas of kelp bed habitats.A kelp bed restoration program begun in the 1960s has apparently succeeded in these areas, and kelp has been reestablished off Point Fermin, in Abalone Cove and offshore of Halfway Point.

Intertidal Zone Habitats:Consist of a variety of coastal habitats periodically covered and uncovered by waves and tides.The rocky shores support a rich assortment of plants and animals including green, brown and red algae.A wide variety of invertebrates compete for space with the plants in this habitat.Mobile invertebrates, such as crabs and snails can be found in great abundance.Fishes are limited to tidepools during high tide, while shorebirds actively forage during low tide.The black abalone (*Haliotis cracherodii*) is a federally-endangered species and critically endangered species of the International Union for Conservation of Nature–Red List (IUCN).At one time, the black abalone was plentiful in the rocky intertidal and nearshore rocky subtidal areas in the SEA down to about 20 feet depth.Whether it still exists in the SEA is unknown, because its current occurrences are widely scattered and much reduced by overfishing and wasting disease.

Nearshore Subtidal Habitat:Includes those marine habitats ranging from the lower level of the intertidal zone to 99 feet.This region supports a variety of assemblages of invertebrates and fishes, and along the coastline of the SEA this habitat is dominated by giant kelp.

Kelp Forest Habitat:Kelp beds dominated by giant kelp are found in some locations in the area.These have tremendous value to the biota of nearshore areas.Where they occur, they may locally account for 90% of the biomass, providing structure and structural complexity for their community from the rocky base through the water column to the surface.Giant kelp is the fastest lengthening organism known, and it thrives in nutrient-enriched waters of upwelling.The giant kelp provides food and habitat for hundreds of species and all the phyla.The kelp beds are an important nursery habitat and recruitment area for juvenile fishes and invertebrates.Many of the species that this habitat supports are the basic components of the food chains of nearshore fishes.Kelp beds are also important because they reduce wave shock to shorelines.This protection helps maintain the abundance and complexity of the marine life found there.

Marine Habitat:Has the greatest diversity of wildlife, with representatives from nearly all the phyla (major groupings of animals, such as jellyfish, mollusks, echinoderms, etc.) and all parts of the food

web (trophic levels) for several communities. Many of the marine phyla do not have terrestrial representatives. Some of the vertebrates, such as gray whales, and the plankton use the area as a migratory corridor. The major vegetation communities, each with its own great diversity and all trophic levels, are the benthic algae of rocky substrates, the kelp beds based on giant kelp holding onto rocky subtidal substrate and extending into the water column, and the planktonic, which are based on photosynthesizers that are microscopic and are throughout the water column in photosynthetic depths.

Wildlife

The wildlife found in the SEA is dependent upon the two basic regimes:marine and terrestrial.The shoreline and bluffs that overlook the coastal sections are homes and migratory rest areas for a wide variety of birds and marine life.The interior grasslands and ravines have a very different assemblage than the coast.Some of the SEA areas are separate and isolated from one another and probably suffer from the effects of the fragmentation of a larger, more contiguous ecosystem, and exhibiting a reduced number of species from what might be expected.

The mountainous Palos Verdes Peninsula juts out into the Pacific Ocean, relative to developed coastline to the north and south and offers many undisturbed habitats for marine and shorebirds.These and offshore rocks offer ideal roosting and feeding sites for numerous birds that affiliated with the coastline.The area is an important stop for migrating birds as they fly along the coast or across the Santa Monica Bay.In addition, the bluff tops and marine terraces, which are now either residences or abandoned agricultural fields, are utilized by many species in winter as feeding grounds.One fully protected species, the American peregrine falcon, and one uncommon species of conservation concern, the prairie falcon, have been known to winter here in recent years.

All wildlife species previously recorded, as well as those expected to occur, within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEAs*.Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

The SEA is on the Pacific Flyway migration route, which is used by many birds seasonally and plays an important role as a stopover because of its extensive undisturbed marine resources.It does not fall within any identified terrestrial movement routes for wildlife because it is isolated by the ocean on one side, and enclosed by miles of developed land on the remaining terrestrial sides.

The offshore major part of the SEA is on the annual migration route of the California gray whale (*Eschrichtius robustus*), which is a Convention on International Trade in Endangered Species (CITES) Appendix I animal. This means that they have endangered status, and no trade or harvest is permitted, except by strictly controlled export and import permits that are issued in countries that are party to the convention and have legislation of adoption, which includes the U.S.The gray whale migrates close to shore on its transit during the winter months, from the Bering Sea to lagoons of Baja California for calving and breeding.A whale count station is manned by volunteers at the Point Vicente Park and Interpretive Center that has yearly records, starting in 1979.The whales generally return north offshore.The area may be a migration corridor for other marine animals, as this is part of the great Southern California Bight, which has an eddy circling counterclockwise to the north off the southward flow of the California Current.This flow brings marine organisms (fishes, invertebrates,

and plants) that may have major population concentrations in the south to this part of the ocean habitat.Most of these organisms have a planktonic stage that is dependent on the current system to maintain their populations and distribution.Pollution of the ocean waters by development on land will have significant effects that may not be appreciated immediately because of the cryptic nature of subtidal animals and plants.

Other Cites Appendix I mammals have been recorded as using the SEA in the Point Vicente records including: sperm whales (*Physeter macrocephalus*), minke whales (*Balaenoptera acutorostrata*), humpback whales (*Megaptera novaeangliae*), blue whales (*Balaenoptera musculus*), fin whales (*Balaenoptera physalus*), and southern sea otters (*Enhydra lutris nereis*).

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas."Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species.The terrestrial parts of this SEA are virtually all critical habitat for the coastal California gnatcatcher.Many of the broader canyons and marine terrace bluff areas are also critical habitat for the Palos Verdes blue butterfly.

Sensitive Plant Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.These communities include silver dune lupine–mock heather scrub, California brittle bush scrub, bush monkeyflower scrub, ashy buckwheat scrub, Menzie's golden bush scrub, and black willow thickets, which occur in the SEA.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section. Changes to the classification system mentioned earlier, in some cases divide plant communities into many possible vegetation alliances, not all of which may be considered sensitive.For the purposes here previously listed communities with at least one sensitive alliance in the new format have been listed.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited

distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Aphanisma (*Aphanisma blitoides*)RPR 1B.1
- Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*)FE, SE, RPR 1B.1
- Coastal dunes milk-vetch (*Astragalus tener* var. *titi*)FE, SE, RPR 1B.1
- Coulter's saltbush (*Atriplex coulteri*)RPR 1B.2
- South Coast saltscale (*Atriplex pacifica*)RPR 1B.2
- Parish's brittlescale (*Atriplex parishii*)RPR 1B.1
- Davidson's saltscale (*Atriplex serenana* var. *davidsonii*)RPR 1B.2
- Southern tarplant (*Centromadia parryi* ssp. *australis*)RPR 1B.1
- Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*)RPR 1B.1
- Coastal goosefoot (*Chenopodium littoreum*)RPR 1B.2
- Catalina crossosoma (*Crossosoma californicum*)RPR 1B.2
- Beach spectaclepod (*Dithyrea maritima*)ST, RPR 1B.1
- Many-stemmed dudleya (*Dudleya multicaulis*)RPR 1B.2
- Island green dudleya (*Dudleya virens* ssp. *insularis*)RPR 1B.2
- Southern island mallow (*Lavatera assurgentiflora* ssp. *glabra*)RPR 1B.1
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)RPR 1B.1
- Santa Catalina Island desert-thorn (*Lycium brevipes* var. *hassei*)RPR 1B.1
- Coast woolly-heads (*Nemacaulis denudata* var. *denudata*)RPR 1B.2
- South coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis*)RPR 4.2
- Brand's star phacelia (*Phacelia stellaris*)FC, RPR 1B.1

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA

based on habitat requirements and known range attributes:

- Belkin's dune tabanid fly (*Brennania belkini*)~~CDFG~~CDFW Special Animals List
- Busck's gallmoth (*Carolella busckana*)~~CDFG~~CDFW Special Animals List
- Sandy beach tiger beetle (*Cicindela hirticollis gravida*)~~CDFG~~CDFW Special Animals List
- Western beach tiger beetle (*Cicindela latesignata latesignata*)~~CDFG~~CDFW Special Animals List
- Senile tiger beetle (*Cicindela senilis frosti*)~~CDFG~~CDFW Special Animals List
- Globose dune beetle (*Coelus globosus*)~~CDFG~~CDFW Special Animals List
- Monarch butterfly (*Danaus plexippus*)~~CDFG~~CDFW Special Animals List
- Henne's eucosman moth (*Eucosma hennei*)~~CDFG~~CDFW Special Animals List
- El Segundo blue butterfly (*Euphilotes battoides allyni*)FE, Xerces:Critical
- Palos Verdes blue butterfly (*Glaucopsyche lygdamus palosverdesensis*)FE, Xerces:Critical
- Lange's El Segundo Dune weevil (*Onychobaris langei*)~~CDFG~~CDFW Special Animals List
- Wandering skipper (*Panoquina errans*)~~CDFG~~CDFW Special Animals List
- Dorothy's El Segundo Dune weevil (*Trigonoscuta dorothea dorothea*)~~CDFG~~CDFW Special Animals List
- Black abalone (*Haliotis cracherodii*)FE
- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Western snowy plover (*Charadrius alexandrinus nivosus*)FT, BCC, SSC, ABC, AWL, USBC
- Southwestern willow flycatcher (*Empidonax traillii extimus*)FE, FSS, SE, USBC, AWL, ABC
- California black rail (*Laterallus jamaicensis coturniculus*)BCC, ST, ~~CDFG~~CDFW Fully Protected, USBC, AWL, ABC
- California brown pelican (*Pelecanus occidentalis californicus*)FE, SE
- Coastal California gnatcatcher (*Polioptila californica californica*)FT, SSC, USBC, AWL, ABC
- California least tern (*Sternula antillarum browni*)FE, SE, ~~CDFG~~CDFW Fully Protected, USBC, ABC

- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Silver-haired bat (*Lasionycteris noctivagans*)WBWG Medium
- San Diego desert woodrat (*Neotoma lepida intermedia*)SSC
- Pocketed free-tailed bat (*Nyctinomops femorosaccus*)SSC, WBWG Medium
- Big free-tailed bat (*Nyctinomops macrotis*)SSC, WBWG Medium-High
- Pacific pocket mouse (*Perognathus longimembris pacificus*)FE, SSC
- American badger (*Taxidea taxus*)SSC
- Minke whale (*Balaenoptera acutorostrata*)CITES Appendix I, IUCN least concern
- Blue whale (*Balaenoptera musculus*)CITES Appendix I, IUCN endangered
- Fin whale (*Balaenoptera physalus*)CITES Appendix I, IUCN endangered
- Southern sea otter (*Enhydra lutris nereis*)CITES Appendix I, IUCN endangered
- California gray whale (*Eschrichtius robustus*)CITES Appendix I, FE, IUCN critically endangered
- Humpback whale (*Megaptera novaeangliae*)CITES Appendix I, IUCN least concern
- Northern elephant seal (*Mirounga angustirostris*)~~CDFG~~CDFW Fully protected
- Sperm whale (*Physeter macrocephalus*)CITES Appendix I, IUCN vulnerable

The Palos Verdes blue butterfly is found in only within the County. The El Segundo blue butterfly is listed as federally-endangered and is currently known from a few areas on the Peninsula.Additional suitable habitat is found in the SEA, and the hope is that the one population can expand. The federally-threatened coastal California gnatcatcher occurs in the coastal sage scrub of the Peninsula, both in and outside of the SEA. The California least tern feeds in the near offshore areas, may visit the beaches, and may rest on the cliff and headland areas in the SEA.In addition, the silvery legless lizard and coast horned lizard, both state species of special concern, have the potential to occur in the SEA.

Regional Biological Value

The SEA meets all SEA designation criteria and supports many regional biological values.Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE PALOS VERDES PENINSULA AND COASTLINE SEA

Criterion	Status	Justification

A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	The Palos Verdes Peninsula is the western-most area of breeding for the threatened coastal California gnatcatcher.The headlands and rocky shoreline provide wintering habitat for two important birds: the fully protected California brown pelican and the state-fully protected American peregrine falcon.The canyons of the SEA support three races of birds that are residents only on the Peninsula and the Channel Islands:insular forms of the orange-crowned warbler, western flycatcher, and Allen's hummingbird.Rare plants, such as southern island mallow t, make this area a very special mainland population for species that otherwise occur only on the offshore islands. Island green dudleya, a rare bluff plant known only from Palos Verdes Peninsula, Santa Catalina Island, and San Nicolas Island, occurs in the Portuguese Bend Landslide.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	Unparalleled headlands, rocky shoreline, and the land-sea interface provide for a tremendous variety of biotic resources in the coastline area.Rocky shores support a great number of species, and the upwelling of deep waters provides nutrient-rich waters for the area's kelp beds, which are dominated by giant kelp.Kelp beds were formerly common off the Southern California coast wherever rocks were present at shallow depths.However, due to man-made and natural phenomena, this habitat has been severely diminished in the region.The mainland SEA areas contain mainland populations of species that occur chiefly on the offshore Channel Islands.Any population characteristic of an island is of extremely restricted regional distribution.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Met	Kelp beds are now rare in the County. These algal communities can account for 90% of the biomass where they occur, and provide food and habitat for hundreds of species. Like terrestrial forests, they moderate the microclimate, reduce wave shock to shorelines and provide shade and shelter to their myriad denizens. The coastal cliffs support coastal sage and coastal strand vegetation, which are rare in Los Angeles because of the scarcity of rocky headlands. The Peninsula's former island status and current maintenance of mainland populations of species that occur chiefly on the offshore Channel Islands are very special. Any population characteristic of an island is of extremely restricted distribution in the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The coastal cliffs provide ideal roosting and feeding sites for numerous shorebirds, gulls, and other seabirds, including the fully-protected California brown pelican. This headland is a principal rest-stop for migrating terrestrial and marine birds on the Pacific Flyway and a wintering area for some migrants. Bluff tops and marine terraces of abandoned agricultural fields are utilized by many species as winter feeding grounds. The Palos Verde Peninsula is

			the western-most area of breeding for the federally-threatened coastal California gnatcatcher. It has numerous plant and animal species that only occur here and otherwise on the offshore islands, so this is a special area for all phases of their life cycles. The marine area is an important migration area for all of the sealife and marine mammals.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	Much scientific and educational work has been done on this part of the coastline. State and county agencies have generated a great deal of information about the area. The Peninsula was once an island and has biotic characteristics more like the offshore Channel Islands than the rest of the County. It is an anomaly of an island now attached to the mainland, and thus interesting for biogeographic studies. The Peninsula canyons are the western-most area of breeding coastal California gnatcatchers. Because of the resident birds and plants that occur only on the Palos Verdes Peninsula and the Channel Islands, this area is of scientific interest for study of island biogeography and evolutionary ecology.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	As the only extensive (10 miles long) rocky intertidal shoreline in the County, the coastline is an important area for preserving its intense biodiversity. It has headlands, rocky shoreline cliffs, rocky intertidal areas, boulder field intertidal areas, kelp beds, coastal strand, ephemeral coastal strand, and coastal sage scrub. The bluffs have a special array of plants found nowhere else on the County mainland. The Peninsula has diverse communities typical of the offshore Channel Islands including coastal sage scrub (which is used by the mainland threatened bird, coastal California gnatcatcher), chaparral, and riparian habitats. The SEA canyons are the least disturbed coastal drainages of the County.

In conclusion, the area is an SEA because it contains: A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, and migrating grounds, which are limited in availability in the County; E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Puente Hills SEA

Location

General

The Puente Hills Significant Ecological Area (SEA) is located in the Puente Hills in the southeastern

portion of the County.The Puente Hills are an inland topographical feature that separates the San Gabriel Valley to the north and the coastal plain to the south.The hills are oriented east-west and stretch from the San Gabriel River on the west approximately to the San Bernardino-Los Angeles County line to the east, where they transition into the Chino Hills.The SEA includes portions of the Whittier Narrows Dam Recreation Area and Flood Control Basin, and much of the undeveloped land throughout the Puente Hills.Nearly the entire SEA is designated as the Puente-Chino Hills State Important Bird Area(IBA) by California Audubon.The main area hosts migrating and resident birds that use the extensive mosaic of lowland terrestrial habitats, and notable extensive areas of grassland and oak and walnut woodlands.This IBA extends well beyond the SEA into Orange and San Bernardino counties, and in general, goes beyond the SEA boundaries in most places.The northwestern disjunct area of the SEA is part of the Los Angeles Flood Control Basin IBA, which hosts many resident and migrating birds that use the wetlands.This IBA extends beyond the SEA on both the Rio Hondo and a long distance upstream along the San Gabriel River.

The SEA encompasses portions of the El Monte, Baldwin Park, Whittier, La Habra and Yorba Linda United States Geological Survey (USGS) 7.5' California Quadrangles.The majority of this SEA lies within unincorporated area of the County.

General Boundary and Resources Description

In the westernmost part of the SEA, boundaries encompass the undeveloped portions of the Montebello Hills.The oil field and transmission lines that occupy this area have protectively-fenced and left most of the coastal sage scrub, which is inhabited by the largest population of the federally-threatened coastal California gnatcatcher (*Polioptila californica californica*) in the County.This area is part of critical habitat for the gnatcatcher.Boundaries of critical habitat extend to Montebello Boulevard on the north side and to the west side of San Gabriel Boulevard, while the SEA boundary stops at the transmission lines' southern edge.Some of the canyons in the oil field have oak woodland.

The SEA has a finger that extends from the Montebello Hills section over San Gabriel Boulevard to the oak woodland (among oil field structures) that borders the Rio Hondo Channel.The SEA finger continues upstream along the natural riparian course of the Rio Hondo to a point where the Rio Hondo is encased as a concrete flood control channel.This area of the Rio Hondo usually has water and is on the migration route for migrating and wintering waterfowl.The riparian area of the Rio Hondo immediately north of San Gabriel Boulevard has long been recognized as important to birds and has been called "Bosque Del Rio Hondo" since Spanish occupation of this area.Abundance of birdlife is frequently mentioned, but the area also has amphibians, reptiles, mammals, and probably fishes.

It is intended that the SEA encompass only natural areas of the basin and portions of the San Gabriel River and Rio Hondo, and the SEA in this area is disjunct from the rest of the Puente Hills.A golf course that is part of the Whittier Narrows Dam County Recreation Area is on the west side of Rio Hondo, and the golf course is not included in the SEA.Likewise, the manicured areas of the County Recreation Area on the east side of Rio Hondo are not included.

Moving east, the southern boundary of the SEA follows the upstream edge of the Whittier Narrows Dam, while the northern boundary goes east along the south side of Durfee Avenue from the east bank of the Rio Hondo.This captures the Flood Control Basin at the confluence of the San Gabriel River and Rio Hondo.The pool at the base of the Whittier Narrows Dam, which often has migrant

waterfowl, is included in the SEA.In the Flood Control Basin the connective channel between the Rio Hondo and the San Gabriel River has native riparian vegetation and usually has water.The connective channel is included in both the SEA and the critical habitat for the coastal California gnatcatcher.The northern SEA boundary follows the south side of Durfee Avenue eastward to near the junction with Peck Road.Here the northern SEA boundary follows the northern side of the grounds of the Whittier Narrows Nature Center to the San Gabriel River, which is naturally vegetatedwith a soft bottom.The southern SEA boundary has outlined the natural vegetation of the flood control basin and connective channel, with a finger extending south downstream along natural riparian vegetation in the San Gabriel River, to the crossing of San Gabriel Boulevard.Across from the Whittier Narrows Nature Center, the southern boundary is along the southeast side of the San Gabriel River.A finger of the SEA extends upstream along the area of the San Gabriel River, which has soft-bottom and native riparian vegetation upstream about one mile (three-quarters of a mile beyond the crossing of State Route-60, which is a short distance upstream from the Whittier Narrows Nature Center area).This includes the confluence with San Jose Creek that drains the south side of the San Jose Hills, and the north side of the Puente Hills.Currently, the Whittier Narrows area of the SEA outlined above is not physically connected to the remainder of the SEA due to urban development on both sides of Interstate-605.

Much of San Jose Creek is channelized, and the City of Industry is located in the flood plain.Because of this, most wildlife movement cannot use the main watercourse route, which makes Puente Hills the wildlife corridor through the area.A plan for the Whittier Narrows area, sometimes called “the Emerald Necklace,” proposes to eventually have a string of parks along the San Gabriel River and Rio Hondo, stretching from the Whittier Narrows Dam County Recreation Area along the rivers to the Santa Fe Dam area, into the City of Irwindale.This would better connect wildlife from the Puente Hills, Chino Hills, Santa Ana Mountains and the other Peninsular Ranges of Southern California with the San Gabriel Mountains, and the Transverse Ranges across the northern side of the San Gabriel Valley.

Moving east across Interstate-605, the SEA begins at the end of Sycamore Canyon Road and the mouth of Sycamore Canyon (off Workman Mill Road on the south side of the west section of Rose Hills Memorial Park). The northern boundary essentially follows the edge of developed portions of the Rose Hills Memorial Park, the Puente Hills Landfill, and rural residential and suburban developments of the Hacienda Heights area, eastward to Schabarum Regional County Park.The southern boundary in this area tracks the edge of urban development along the southern slopes of the Puente Hills bordering the City of Whittier and the community of La Habra Heights.The SEA in this southern slope area includes some areas impacted by oil production that are otherwise connective by virtue of largely natural habitat of chaparral and grasslands.Much of this area of the SEA is critical habitat for the coastal California gnatcatcher.The critical habitat of the gnatcatcherextends into areas with appropriate habitat for the gnatcatcher among some development, for example,Rose Hills Memorial Park and the Puente Hills Landfill.These areas were not included in the SEA because they did not meet the SEA mapping criteria.

Much of the summit area in the Puente Hills is conserved and under restoration by the Puente HillsHabitat Preservation Authority (PHHPA), which has sponsored important studies on habitat and wildlife movement, restoration, and the wildlife movement tunnel under Harbor Boulevard at the eastern side of the SEA. The SEA in this western end of the Puente Hills includes important natural drainages on the west side of the Puente Hills, which drain to the San Gabriel River: much of Sycamore Canyon, with a fine riparian woodland; and Turnbull Canyon with a mixed riparian forest

containing ash, sycamore, and oak.The ridges around Turnbull Canyon are mixed grassland and chaparral, with coastal sage scrub and a scattered population of the federally-threatened coastal California gnatcatcher.Mixed chaparral and cactus scrub on the Turnbull Canyon and Sycamore Canyon slopes support a local population of the sensitive coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*).Other areas of the southwest slope drainages include Worsham Creek, La CañadaVerde Creek, Arroyo Pescadero, and San Miguel Creek.Underpasses of Colima Road, which could otherwise block the east-west wildlife movement along the Puente Hills, are used by wildlife as shown by studies sponsored by the PHHPA. (SWCA Environmental Consultants, 2012)

A lobe of the SEA goes over the ridge to natural habitat along north-facing slopes.These tributaries of Joe Hill Wash have a mix of oak and walnut woodland habitats along multiple drainages that end in San Jose Creek.Other areas of north slope drainage to San Jose Creek are included in the SEA on the southeast side of Workman Mill and along the transmission line corridor in the Workman Mill area.The north-slope boundary skirts the developed areas of the community of Hacienda Heights.An area of planned development in the oak woodland just west of Schabarum Regional County Park has been excluded from the SEA.

Continuing east, the northern SEA boundary crosses the Schabarum Park accessory corridor and includes the undeveloped portions, as well as those of neighboring Trailview County Park in the SEA.Here the northern boundary is trending southeast, skirting along the edge of residential development within unincorporated Rowland Heights.The southern SEA boundary in this area skirts development in the community of La Habra Heights and includes the southern slope of Powder Canyon, which has a variety of natural habitats including riparian and north-slope oak woodland, California walnut woodland, rocky hillsides, chaparral, and some grassland.Powder Canyon is part of the watershed of San Jose Creek.Here the SEA crosses Fullerton Road in a broad swath about a 0.4mile wide that includes the Powder Canyon undercrossing and Pathfinder Park on the east side.Pathfinder Park has riparian and chaparral habitat.There is an area around the ridgeline development along Vantage Pointe Drive that has been excluded from the SEA.

The northern SEA boundary continues along the edge of development at the southern edge of the communities of Rowland Heights to include walnut woodland, oak woodland, grassland, and chaparral vegetation on the north-facing slopes and central ridge of the Puente Hills.This area includes tributaries in the Puente Hills for the Brea Canyon watershed.The boundary crosses Brea Canyon (Santa Ana River watershed) and State Route-57 at the edge of development in the Ciyt of Diamond Bar, and continues along the boundary of natural vegetation to the San Bernardino-Los Angeles County line.East of State Route-57, this urban-wildland interface is more or less the boundary between development in the eastern San Gabriel Valley and the natural areas of the Firestone Boy Scout Reservation, with its focal area on Tonner Canyon (also in the Santa Ana River watershed).

From the crossing of Fullerton Road, the southern SEA boundary encompasses the naturally-vegetated central ridgeline of the Puente Hills, and extends south along the west side of Harbor Boulevard to include natural area around a wildlife passage tunnel under Harbor Boulevard. This tunnel was constructed by the Puente Hills Landfill Natural Habitat Preservation Authority, and its mud floor has many track prints that attest to frequent use by deer and other animals.The tunnel has the ridgeline area on its west side (with scattered residences), and on the east side are a deep canyon with fine riparian oak woodland, hills with scattered oil wells, walnut woodland, and grasslands.The southern boundary includes the canyon, but excludes the hills and grasslands of the

oil field that are on the ridgeline and south of the canyon. On the northern slope of the included canyon is the Vantage Pointe development, which is excluded from the SEA.On the east side of the oil field, the southern SEA boundary trends southeast along natural vegetation boundaries to the Orange-Los Angeles County line.At the Orange-Los Angeles County line, the SEA borders the development in the City of Brea in Orange County for a short distance, and continues through grassland and chaparral to cross the State Route-57 into walnut woodlands, southern oak woodland, chaparral, coastal sage scrub, and riparian woodlands of Tonner Canyon on the Firestone Boy Scout Reservation. Tonner Canyon is in the Santa Ana River watershed, and the ridge separating Brea and Tonner canyons is generally considered the divide between the Puente Hills and the Chino Hills. From here the southern SEA boundary continues eastward on the Orange-Los Angeles County line to the three-way junction with the San Bernardino-Los Angeles County line. For its eastern border in the Chino Hills, the SEA boundary turns north and follows along the San Bernardino-Los Angeles County line to contact with the northern boundary.In Orange County, south of the Orange-Los Angeles County line, is the Chino Hills State Park, with grasslands, chaparral, and riparian oak woodlands that extend across into the Firestone Boy Scout Reservation.

Critical habitat for the coastal California gnatcatcher is generally coincident with the SEA in the western part of the SEA, but has lobes and fingers that extend into development areas where the preferred natural habitat of the gnatcatcher, coastal sage scrub, coexists with less dense residential areas.East of Fullerton Road, the gnatcatcher critical habitat differs from the SEA.Gnatcatcher critical habitat narrowly includes the Harbor Boulevard wildlife passage tunnel, goes on the south side of the Vantage Point exclusion area, and trends into Orange County on the eastern side of the oilfield that borders the Vantage Point development.There is a small area of gnatcatcher critical habitat in the Firestone Boy Scout Reservation in the County that connects to the large area of critical habitat in Orange County and the Chino Hills.

The majority of the SEA lies within unincorporated County jurisdiction.Other local jurisdictions have also been included within the SEA in order to delineate the boundaries of functioning habitat units.These include the City of Diamond Bar, the City of Industry, the City of La Habra Heights, the City of Montebello, the City of Pico Rivera, the City of South El Monte, and the City of Whittier.

Vegetation

The SEA encompasses the remaining relatively undisturbed habitat areas in the County portion of the Puente Hills.These include portions of the Montebello Hills, Whittier Narrows, Rio Hondo, Sycamore Canyon and Turnbull Canyon to the west; Powder Canyon; and Brea Canyon and Tonner Canyon to the east.Each of these areas contains relatively undisturbed examples of woodland, shrubland, grassland and wetland communities that once existed throughout the inland hills complex of the Los Angeles Basin.Included among these habitats are excellent examples of oak woodland, oak riparian forest, southern willow scrub and walnut woodland.Intermixed with these are stands of mixed chaparral, coastal sage scrub and grasslands, which taken as a whole, form a valuable wildlife habitat unit of regional importance.It should be noted that the SEA includes areas disturbed and developed for rural residential and oil extraction.Generally, these conditions are found in the Montebello Hills, Brea Canyon, La Habra Heights, and the hills above the Whittier area.

Interconnecting corridors for wildlife have a mixture of disturbed habitat areas, native vegetation, naturalized vegetation, and sparsely developed land. While such areas do not represent key regional habitats, they have been recommended for inclusion in the SEA in order to recognize the importance

of the wildlife corridor function of theSEA to exchange genetic material between plant and animal populations throughout the Puente Hills, the Chino Hills, the Santa Ana Mountains, and the natural areas of other Peninsular Ranges of Southern and Baja California.

Good examples of the variety of riparian habitat are found near the Whittier Narrows Nature Center, including lowland riparian and freshwater marsh habitat, rich soils deposited from flood waters, and impressive streamside vegetation of willows, sycamores, cottonwoods, and mulefat.The Whittier Narrows Nature Center has records for the County Recreation Area, which document a very rich and diverse vertebrate fauna with 24 species of mammals, over 300 species of birds, 8 reptiles, 4 amphibians, and several fishes.The birds include 65 sensitive species and 50 year-round resident species.Most of these are related in some way to the riparian habitats.

Plant communities identified in the *Significant Ecological Area Description* in 2006 used the standard methodology and terminology of the time.Eight major plant communities found within the Puente Hills SEA were listed in 2006: oak woodland, oak riparian forest, walnut woodland, southern willow scrub, chaparral, coastal sage scrub, freshwater marsh, and non-native grassland.The variety of topography, soil types, slope aspects and water availability within this SEA creates a range of physical habitats, which support numerous plant species.

Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.*Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA are given below.

Oak Woodland:A plant community dominated by species of the oak genus (*Quercus*).Within this SEA this species is the coast live oak (*Quercus agrifolia* var. *agrifolia*), which typically grows to heights of 20 to 40 feet and forms either closed or open tree canopies.Understory vegetation varies from grassland in areas subject to grazing to shrubs where topography is steeper and/or grazing has been relaxed.It may also intergrade with shrub communities.Within this SEA, oak woodland is scattered throughout many hillsides, drainages and broad valleys, it is most prevalent on northfacing slopes and in drainage bottoms.Particularly large complexes of oak woodland are found in Powder Canyon, Brea Canyon, Tonner Canyon, and the hills of Hacienda Heights.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance

Oak Riparian Forest: A highly related community to oak woodland found in this SEA.This community is also dominated by coast live oak.The primary difference between oak woodland and oak riparian forest is the greater availability of water in riparian situations, which is expressed in a denser tree canopy and higher density of trees.There is also a greater number of hydrophytic (moister favoring) plant species in the understory.Typical riparian trees, such as western sycamore (*Platanus racemosa*) and willow (*Salix* spp.), commonly occur as well.Oak riparian forest is best developed within the Sycamore Canyon, Turnbull Canyon, Brea Canyon, and Tonner Canyon drainages.It is also scattered in other drainages throughout the SEA.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak forest) Forest Alliance

- *Platanus racemosa* (California sycamore woodlands) Woodland Alliance

Walnut Woodland:Often intergrades with oak dominated woodlands or develops as a distinct community.This community is dominated by the Southern California black walnut (*Juglans californica*), which grows 10 to 30 feet high.More often than not, the Southern California black walnut grows in open stands; however, closed tree canopies are not uncommon.In similar fashion to oak woodlands its understory varies from grasses to shrubs.Thus, it forms stands ranging from savannahs to forests throughout the SEA.It is most common on the hillsides of Brea Canyon, Powder Canyon, and Tonner Canyon, where it forms some of the best developed examples south of Ventura County in Southern California.

Corresponding MCV communities:

- *Juglans californica* (Southern California black walnut groves) Woodland Alliance

Southern Willow Scrub: Well developed southern willow scrub communities are found along several major canyon bottoms in this SEA, particularly Brea Canyon and Tonner Canyon.Smaller patches of this community are also found scattered along smaller drainage and tributaries, as well as at seeps and around artificially created impoundments used for livestock watering.This community is dominated by species of *Salix*, which form nearly monotypic stands, due to their dense growth.These stands generally reach 10 to 20 feet in height with little understory vegetation.

Corresponding MCV communities:

- *Salix exigua* (sandbar willow thickets) Shrubland Alliance

- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance

Mixed Chaparral:A shrub community composed of robust species.Within this SEA, these species include laurel sumac (*Malosma laurina*), toyon (*Heteromeles arbutifolia*), lemonadeberry (*Rhus integrifolia*), and western blue-elderberry (*Sambucus nigra* var. *caerulea*).These and other shrub species form dense vegetation covers that grow 5 to 10 feet in height.The development of chaparral is most pronounced and extensive within Sycamore Canyon, Turnbull Canyon, Brea Canyon and Tonner Canyon.

Corresponding MCV communities:

- *Prunus ilicifolia* (holly leaf cherry chaparral) Shrubland Alliance

- *Rhus ovata*(sugarbush chaparral) Shrubland Alliance

Coastal Sage Scrub: A shrubland community that exhibitsa shorter stature than chaparral, dominated by drought deciduous shrubs.This plant community is dominated by California sagebrush (*Artemisia californica*), California brittle bush (*Encelia californica*), white sage (*Salvia apiana*), black sage (*Salvia mellifera*), and California buckwheat (*Eriogonum fasciculatum*).Coastal sage scrub also

forms dense stands, which grow three to four feet in height.Within this SEA, it may be found in scattered patches or large contiguous stands, which are highly integrated with mixed chaparral, including areas used for oil extraction where coastal sage scrub persists and previously disturbed areas where it has become reestablished. An important subunit of coastal sage scrub found within this SEA is cactus scrub, which is found extensively on southerly and westerly slopes, especially in Sycamore Canyon, Hellman Park and La Habra Heights.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatuma* (California sagebrush-California scrub)Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Keckiella antirrhinoides* (bush penstemon scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub) Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub)Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub)Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub)Shrubland Alliance

Non-Native Grassland:Dominated by non-native annual grasses and forbs, but potentially supporting stands of native grasses and wildflowers, including special-status plant species.Dominant species typically include brome grasses, wild oats and mustards. This community has become established as a result of livestock grazing, whereby native vegetation is removed (sometimes by mechanical means) and replaced by more opportunistic species.Non-native grassland is found throughout all areas of this SEA and may support a variety of wildlife species adapted to open habitats of low stature, including several grassland-dependant bird species.

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*)(wild oats grasslands)Semi-Natural Herbaceous Stands
- *Brassica* (*nigra*) and other mustards (upland mustards) Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus*, *hordeaceus*)-*Brachypodium distachyon* (annual brome grasslands) Semi-Natural Herbaceous Stands

- *Bromus rubens-Schismus* (*arabicus*, *barbatus*)([*Bromus madritensis* ssp. *rubens*] red brome or Mediterranean grass grasslands)Semi-Natural Herbaceous Stands

- *Centaurea* (*solstitialis*, *melitensis*)(yellow star-thistle fields) Semi-Natural Herbaceous Stands

- Lolium perenne ([Festuca perennis] perennial rye grass fields) Semi-Natural Herbaceous Stands

Freshwater Marsh: Small areas supporting freshwater marsh are found at scattered locations in the broader valleys along major drainages.This community may also exist at other locations in and around artificially created impoundments that are used to water livestock.Freshwater marsh requires perennially shallow water or saturated soils.Dominant plants are emergent species, including cattails and bulrushes.

Corresponding MCV communities:

- *Phragmites australis* (common reed marshes) Herbaceous Alliance and Semi-Natural Stands

- *Schoenoplectus californicus* (California bulrush marsh) Herbaceous Alliance

- *Typha* (*angustifolia*, *domingensis*, *latifolia*)(cattail marshes) Herbaceous Alliance

- *Sarcocornia pacifica* (*Salicornia depressa*)([*Salicornia pacifica*] pickleweed mats) Herbaceous Alliance

- *Lemna* (*minor*) and relatives (duckweed blooms) Provisional Herbaceous Alliance

Wildlife

Wildlife within the SEA has been frequently documented to be very diverse and abundant due to the large acreage of natural open space, the diversity of habitat types, and regional connectivity.While a few wildlife species are entirely dependent on a single vegetative community, the entire mosaic of all the vegetation communities within the SEA and connected areas constitutes a functional ecosystem for a wide variety of wildlife species.This includes areas within the SEA as well as the regional ecosystem.

Analysis of invertebrates on any given site generally is limited by a lack of specific data; however, the size of the SEA and diversity of habitats present is considered sufficient to encompass healthy populations of a large number of invertebrate species.Amphibian populations are generally restricted in semi-arid and arid habitats, but may be particularly abundant where riparian areas occur.The SEA is likely to support a variety of amphibians in abundance within wetland areas along the major canyon bottoms and the moister oak woodland areas.Many essential reptilian habitat characteristics are present within the SEA.These include open habitats that allow free movement and high visibility and small mammal burrows for cover and escape from predators and extreme weather.These characteristics, as well as the variety of habitat types present, are likely to support a wide variety of reptilian species.

The scrubland, woodland, riparian, and grassland habitats in the SEA provide foraging and cover habitat for year-round residents, seasonal residents, and migrating song birds.In addition, the SEA

encompasses many year-round water sources, abundant raptor foraging, perching, and nesting habitat.The combination of these resources as well as the mosaic of many community types provides for a high diversity of bird species.Several of these species, including California gnatcatcher and cactus wren, may use this SEA as their only consistent occurrence in the southeastern portion of the County.

Not unlike other taxonomic groups, mammal populations within the SEA are diverse and reflective of the unique combination of several habitat types.Unlike many other inland hills within the Los Angeles Basin, this SEA is large enough to support relatively stable large mammal populations despite the urban surroundings. Such mammals include bobcat, mountain lion and mule deer.

Invertebrates were investigated by LSA (2005), who documented several scarce butterflies, including California dogface (*Colias eurydice*), western tailed-blue (*Everes amyntula*), Mormon metalmark (*Apodemia mormo*), and fatal metalmark (*Calephelis nemesis*).

The herpetofauna of this SEA was investigated by Haas et. al. (2002) and LSA (2005), who found the hills to support several locally rare or sensitive species including western spadefoot, arboreal salamander, two species of slender salamander (*Batrachoseps nigriventris* and *B. major*), coastal whiptail (*Cnemidophorus tigris stejnegeri*), red diamondback rattlesnake (*Crotalus ruber*), and western blind snake (*Leptotyphlops humilis*).

Sensitive mammals include the San Diego desert woodrat (*Neotoma lepida intermedia*) and habitat specialists such as cactus mouse (*Peromyscus eremicus*) and western gray squirrel (*Sciurus griseus*).

The Puente Hills are extremely important for bats, with eleven species documented recently (Remington 2006), including Yuma myotis (*Myotis yumanensis*), western red bat (*Lasiurus cinereus*), pallid bat (*Antrozus pallidus*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), and western mastiff bat (*Eumops perotis*).

The federally Threatened California gnatcatcher occurs in at least two areas of the Puente Hills in the vicinity of Arroyo San Miguel east of Colima Drive and a smaller possibly irregular population along Sycamore Canyon. These are among the last areas of occupancy for this bird in the Los Angeles Basin, and among the northenmost for the species.

All wildlife species previously recorded, as well as those expected to occur, within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEAs*.Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

Evidence of significant wildlife movement throughout the Puente Hills SEA has recently been documented in a two year carnivore study commissioned by the Santa Monica Mountains Conservancy as part of a multi-jurisdictional effort to establish a region wide wildlife movement linkage.This SEA represents the County portion of a continuous series of natural open space within the Puente Hills and Chino Hills.Overall, this open space extends north and west from State Route

91 (SR-91) in Orange and Riverside Counties to the Whittier Narrows reach of the San Gabriel River. The open space physically links the Puente/Chino Hills with the Santa Ana Mountains and the San Gabriel Mountains, respectively.By virtue of these linkages and a complex of interconnected habitat units throughout the hills, the Puente/Chino Hills function as both an important wildlife linkage and resident habitat area for regional wildlife populations.

Within the SEA itself several habitat units, well defined by major canyons, exist.These include Sycamore Canyon, Turnbull Canyon, Powder Canyon, Brea Canyon and Tonner Canyon.Each of these, in and of themselves, is capable of supporting a diversity and abundance of wildlife.More importantly, however, these habitat units are connected by a series of open space corridors, which allows population exchange to occur. Maintenance of biological diversity and population viability is accorded throughout the SEA and the chance of local species extinctions due to isolation is minimized.This function is acutely important for wide-ranging species that meet their breeding and/or habitat requirements over broad areas.

Although several major arterial roads and highways cross the hills, continued use of undercrossings and surface crossings by wildlife has been documented.This movement is largely east-west trending between large habitat blocks located in the western, central and eastern portions of the SEA.Species documented as moving through the area include bobcat, coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), and mule deer (*Odocoileus hemionus*).

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas."Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species.The SEA has large coincident areas with the designated critical habitat for the coastal California gnatcatcher.

Sensitive Plant Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.These communities include Southern California black walnut groves, holly leaf cherry chaparral, California brittle bush scrub, bush penstemon scrub, and white sage scrub,which occur throughout the SEA.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Nevin's barberry (*Berberis nevinii*)RPR 1B.1, SE, FE
- Round-leaved filaree (*California macrophylla*)RPR 1B.1
- Southern tarplant (*Centromadia parryi* ssp. *australis*)RPR 1B.1
- Peruvian dodder (*Cuscuta obtusiflora* var. *glandulosa*)RPR 2.2
- Many-stemmed dudleya (*Dudleya multicaulis*)RPR 1B.2
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)RPR 1B.1
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)RPR 1B.1
- Chaparral ragwort (*Senecio aphanactis*)RPR 2.2
- San Bernardino aster (*Symphyotrichum defoliatum*)RPR 1B.2
- Prostrate vernal pool navarretia (*Navarretia prostrata*)RPR 1B.1
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2
- Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*)RPR 1B.2
- Vernal barley (*Hordeum intercedens*)RPR 3.2
- California Orcutt grass (*Orcuttia californica*)RPR 1B.1, SE, FE

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Western spadefoot (*Spea hammondii*)BLMS, SSC
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List

- Rosy boa (*Charina trivirgata*)BLMS, FSS
- Western pond turtle (*Emys marmorata*)BLMS, FSS, SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Coast patch-nosed snake (*Salvadora hexalepis virgultea*)SSC
- Cooper's hawk (*Accipiter cooperii*)~~CDFG~~CDFW Watch List
- Tricolored blackbird (*Agelaius tricolor*)BCC, BLMS, SSC, USBC, AWL, ABC
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Long-eared owl (*Asio otus*)SSC, LAA
- Burrowing owl (*Athene cunicularia*)BCC, BLMS, SSC
- Ferruginous hawk (*Buteo regalis*)BCC, BLMS, ~~CDFG~~CDFW Watch List, AWL, LAA
- Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*)BCC, FSS, SSC
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)FC, BCC, FSS, SE
- White-tailed kite (*Elanus leucurus*)~~CDFG~~CDFW Fully Protected
- Southwestern willow flycatcher (*Empidonax traillii extimus*)FE, FSS, SE, USBC, AWL, ABC
- Merlin (*Falco columbarius*)~~CDFG~~CDFW Watch List
- Yellow-breasted chat (*Icteria virens*)SSC
- Belding's savannah sparrow (*Passerculus sandwichensis beldingi*)SE
- Coastal California gnatcatcher (*Polioptila californica californica*)FT, SSC, USBC, AWL, ABC
- Bank swallow (*Riparia riparia*)ST
- Least Bell's vireo (*Vireo bellii pusillus*)FE, BCC, SE, USBC, AWL, ABC
- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Mexican long-tongued bat (*Choeronycteris mexicana*)SSC, WBWG High
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Silver-haired bat (*Lasionycteris noctivagans*)WBWG Medium

- Hoary bat (*Lasiurus cinereus*)WBWG Medium
- Western yellow bat (*Lasiurus xanthinus*)WBWG High
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)SSC
- Yuma myotis (*Myotis yumaensis*)BLMS, WBWG Low-Medium
- Pocketed free-tailed bat (*Nyctinomops femorosaccus*)SSC, WBWG Medium
- Big free-tailed bat (*Nyctinomops macrotis*)SSC, WBWG Medium-High
- American badger (*Taxidea taxus*)SSC

Regional Biological Value

The SEA meets several SEA designation criteria that consider regional biological values.Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE PUENTE HILLS SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	The population of the California gnatcatcher at the Montebello Hills is probably one of the largest single populations in the U.S. Pairs occur throughout the County portion of the Puente Hills, especially in Sycamore Canyon and Arroyo San Miguel.The coastal cactus wren has significant populations in the Puente Hills, occurring in the Montebello Hills, Sycamore Canyon, Rose Hills, Hellman Park in Whittier, and through Hacienda Heights into Rowland Heights. Several CNPS-Rare plants occur in the Puente Hills, including Weed's mariposa-lily.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	Several plant communities within this SEA are ~~CDFG~~CDFW highest priority communities due to their restricted distribution in the Southern California region.These communities include walnut woodland, which is scattered throughout this SEA: oak riparian woodland, which is best developed in the major drainages of Sycamore Canyon, Turnbull Canyon, Powder Canyon, Brea Canyon, and Tonner Canyon, but is found elsewhere; stands of southern willow scrub along many of the drainages; scattered freshwater marsh; and coastal sage scrub, which is found in scattered patches over hillsides throughout.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	All of the plant communities and habitats mentioned above as being restricted in distribution on a regional basis are also restricted in distribution within the County.

Criterion		Status	Justification
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	This SEA represents the only large complex of multiple, relatively undisturbed habitats in southeastern portion of the County. It is regionally important to many resident species, as well as migrating species, which would otherwise not be able to meet their habitat requirements.In particular, large mammal and overwintering birds of prey and songbirds make use of this area.The Puente Hills are a well known migration corridor for migratory songbirds during spring migration (April and May).On foggy May mornings, the hilltops can support hundreds of individual migrant songbirds, which forage actively in all available habitats.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The Puente Hills represent the clear northern edge of the Peninsular Ranges.For this reason, taxa such as red diamond rattlesnake, occur here at the edge of their range, where they co-occur with the more widespread Pacific rattlesnake.Several bird species extend west through the Puente Hills into the Los Angeles Basin and the Whittier Hills (Oak Titmouse, Grasshopper Sparrow).These species are absent from the floor of the Los Angeles Basin.The Whittier Narrows Nature Center provides the public with extensive information and opportunities for field study of the Whittier Narrows natural environment.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Both the oak woodlands and walnut woodlands within this SEA represent excellent relatively undisturbed examples.The walnut woodlands in this area are reported to be the best remaining stands south of Ventura County.

In conclusion, the area is an SEA because it contains:A) habitat of core populations of endangered or threatened plant species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) populations of scientific interest because they are at range extremes and intermix with species from other areas with known examples of reptiles and birds; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Rio Hondo College Wildlife Santuary SEA

Location

General

The Rio Hondo College Wildlife Sanctuary Significant Ecological Area (SEA) is located on the western edge of the Puente Hills near the San Gabriel River, within the City of Whittier, and south of the Interstate-605.The SEA is the designated a Wildlife Sanctuary of the Rio Hondo College in the northern and eastern part of the campus, and is currently used as a study area by the students and faculty of Rio Hondo College.The SEA includes natural areas bordering two ridgelines—one impacted by

transmission line installation and the maintenance roads, and the other with substantially natural areas.Between the two ridgelines is an intermittent drainage with riparian elements.The area includes good examples of riparian woodland, chaparral, oak woodland, coastal sage scrub, and chaparral communities.The entire unpaved campus area is designated critical habitat for the federally-threatened coastal California gnatcatcher (*Polioptila californica californica).*

The SEA is located within the El Monte United States Geological Survey (USGS) 7.5' California Quadrangle.

General Boundary and Resources Description

The SEA boundaries have a roughly triangular shape. The northern boundary begins in an arroyo with walnut woodland toward the west end of the North Entry Road, and goes southeastward along the border of natural habitat, passing the justice buildings near the bottom of the transmission line ridge. The boundary continues along the base of the ridge to the border with the Rose Hills Memorial Park.On the east side, the boundary tracks the edge of the Rose Hills Memorial Park peripheral road towards the southeast, including a slope of probable restored white-sage scrub.Where the peripheral road meets the crest of the southern ridge, the boundary turns northwest and goes along the southern ridge top, countinues down off the ridge northwestward around the Rio Hondo College campus parking lots and buildings to connect with the small walnut woodland.

The northern ridge primarily contains non-native grassland, with a strong component of introduced mustards, but also a strong component of scattered native chaparral shrubs, such as elderberry (*Sambucus* spp.), sumacs (*Rhus* spp.); and in the ravines, dense growths of large chaparral shrubs,including coast live oak (*Quercus agrifolia*).Some of the slopes on the north ridge have prickly-pear shrub. The watercourse between the ridges is riparian with plants, such as mulefat (*Senecio douglasii*) and coyote bush (*Baccharis* spp.). The ravines on the north face of the southern ridge that border the watercourse have fine oak woodland, cherry woodland, and walnut woodland at the upper ends.The SEA provides examples of many of the common and cherished natural habitats of the County for study.Sign of coyote (*Canis latrans*), fox (probably *Urocyon cinereoargenteus*) and bobcat (*Lynx rufus*) can be noted while walking the transmission line northern ridge. The biotic communities within the SEA contain a variety of plant life and an abundant fauna.

Due to location near the extreme northwestern end of the Peninsular Ranges, the SEA is an excellent place to observe the geographical range variability of a number of species that are characteristic of the mountains to the south, and have their northernmost occurrences in the Puente Hills, such as the red diamond rattlesnake (co-occurring with the Pacific rattlesnake).

Vegetation

There are three native plant communities in the SEA: coastal sage chaparral scrub, chaparral and oak woodland.The remainder of the SEA has areas classified as ornamental landscaping, developed and disturbed.Plant communities identified in the *Significant Ecological Area Update Study* by PCR in 2000 used the standard methodology and terminology of the time.Eight major plant communities found within the SEA were listed in 2000, including oak woodland, oak riparian forest, walnut woodland, southern willow scrub, chaparral, coastal sage chaparral scrub, freshwater marsh, and non-native grassland.The variety of topography, soil types, slope aspects and water availability within this SEA create a range of physical habitats that support numerous plant species.

Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.*Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA are given below.

Oak Woodland:A plant community dominated by species of the oak genus (*Quercus*).Within this SEA this species is the coast live oak (*Quercus agrifolia* var. *agrifolia*), which typically grows to heights of 20 to 40 feet and forms either closed or open tree canopies.Understory vegetation varies from grassland in areas subject to grazing to shrubs where topography is steeper and/or grazing has been relaxed.It may also intergrade with shrub communities, in this case coastal sage chaparral scrub.Within this SEA oak woodland occur along the northern boundary.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance

Walnut Woodland:Often intergrades with oak dominated woodlands or develops as a distinct community.This community is dominated by the Southern California black walnut (*Juglans californica*), which grows 10 to 30 feet high.More often than not, the Southern California black walnut grows in open stands; however, closed tree canopies are not uncommon.In similar fashion to oak woodlands, its understory varies from grasses to shrubs. It forms stands ranging from savannahs to forests throughout the nearby Puente Hills SEA.

Corresponding MCV communities:

- *Juglans californica* (Southern California black walnut groves) Woodland Alliance

Coastal Sage Scrub: A shrubland community found in this SEA is coastal sage chaparral scrub, which has a high percentage of non-native species.This plant community is dominated by California sagebrush (*Artemisia tridentata*), California brittle bush (*Encelia californica*), white sage (*Salvia apiana*), black sage (*Salvia mellifera*), and California buckwheat (*Eriogonum fasciculatum*).Coastal sage chaparral scrub also forms dense stands, which grow three to four feet in height. Where the coastal sage chaparral scrub community is now found had been cleared and disturbed by past disturbances, such as grading and transition line construction.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California scrub)Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance

- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub)Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub)Shrubland Alliance
- *Opuntia littoralis* (coast prickly pear scrub) Shrubland Alliance

Chaparral:A shrub community composed of robust, woody species.Within this SEA these species include laurel sumac (*Malosma laurina*), toyon (*Heteromeles arbutifolia*), lemonadeberry (*Rhus integrifolia*) and prickly-pear cactus.These and other shrub species form dense vegetation covers growing 5 to 10 feet in height.The development of chaparral is most pronounced on north facing slopes within the SEA.

Corresponding MCV communities:

- *Adenostoma fasciculatum* (chamise chaparral) Shrubland Alliance
- *Ceanothus oliganthus* (hairy leaf ceanothus chaparral) Shrubland Alliance
- *Rhus ovata* (sugarbush chaparral) Shrubland Alliance

Developed and ornamental landscaping areas include agricultural use areas, ornamental landscaping, and structures, and occupy the majority of the project area. All perimeter areas, sections adjacent to roads, and space not occupied by parking lots or buildings have been landscaped. Some mulefat (*Baccharis salicifolia*) and sage species have been used for landscaping purposes. Species in this vegetation type included pine, acacia, ash, cotoneaster, eucalyptus and California privet. These species have grown large, with extensive canopies, and have developed an understory in some areas.

Disturbed or Barren Areas: Areas that either completely lack vegetation or are dominated by ruderal species. Ruderal vegetation found within the SEA includes a high proportion of weedy species, including black mustard, fennel, tree tobacco, and castor bean. The disturbed areas are a result of previous use for staging maintenance activities or easements.

Corresponding MCV communities:

No corresponding communities at this time

Wildlife

Wildlife within any ecosystem is largely determined by the available plant communities and in the SEA, the relatively small area only allows for limited local foraging and wildlife habitat.

Analysis of the presence of invertebrates is limited by a lack of specific data; however, the size of the SEA and diversity of habitats present is considered sufficient to encompass healthy populations of a large number of invertebrate species.

The potential presence of amphibians varies greatly between habitats within the project site.Terrestrial species may or may not require standing water for reproduction.Terrestrial species avoid desiccation by burrowing underground; within crevices in trees, rocks, and logs; and under stones and surface litter during the day and dry seasons.Due to their secretive nature, terrestrial amphibians are rarely observed, but may be quite abundant if conditions are favorable.Aquatic amphibians are dependent on standing or flowing water for reproduction.Such habitats include fresh water marshes and open water (reservoirs, permanent and temporary pools and ponds, and perennial streams).

Reptilian diversity and abundance varies with habitat type and character.Although some species prefer only one or two plant communities, most will forage in a variety of communities.A number of reptile species prefer open habitats that allow free movement and high visibility.The only reptiles recorded are the western side-blotched lizard (*Uta stansburiana elegans*) and the Great Basin fence lizard (*Sceloporus occidentalis longipes*).

For birds, some of the reestablishing vegetation in the disturbed areas and some areas of the ornamental landscaping provide limited foraging and cover habitat for year-round residents, seasonal residents, and migrating song birds.In addition, there is seasonally available water onsite within the drainage channels.The overall condition of the plant communities is mainly ornamental landscape.For raptors, some of the habitat within the project site could have the potential to provide foraging opportunities and breeding areas for raptors.Trees found along the perimeter of the project site and throughout the campus have the potential to provide suitable perches for foraging over the open areas and scrub communities.These areas provide habitat for small birds and mammals, which results in a potentially large prey population on the project site.There is remnant coastal sage scrub in the SEA, and this may form a stepping stone for the coastal California gnatcatcher.Both the Puente Hills SEA and the critical habitat of the gnatcatcher are disjunct across Interstate-605.To have connectivity between the gnatcatcher's large population in the Montebello Hills, the SEA extends as a welcoming arm on the east side of Interstate-605.This would be equally important for other aerial fauna and windblown seeds of plants on the west side of Interstate-605.

For mammals, the reestablishing vegetation in the disturbed areas and the landscaped areas on the project site have the potential to support a limited number of mammal species.During field surveys, mammal species were either directly observed or their presence was deduced by diagnostic signs (tracks, scat, burrows, etc.).

All wildlife species previously recorded, as well as those expected to occur, within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEA Update Study 2000 Background Report*.Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section of this document.

Wildlife Movement

The SEA is located in an area of potentially low to moderate value with regards to regional and local terrestrial wildlife movement. The Interstate-605 and industrial development that borders the freeway serves as a barrier for wildlife movement. The SEA is a gateway area for connectivity between the Peninsular Ranges of Southern California and the Transverse Ranges to the north.Naturally, they are connected by use of wildlife, particularly birds, insects, and plant propagules that are found along the San Gabriel River and Rio Hondo, which are only a 0.5 mile to the west of the Rio Hondo College.The San Gabriel River is designated by California Audubon as a State Important Bird Area

(IBA), and extended arms of Semi-Natural habitat are important to connectivity for wildlife of the area and the region.Wildlife species could potentially use the SEA and possibly the ornamentally landscaped areas to facilitate movement and provide access to natural resources located in the Puente Hills.A wide variety of wildlife use linkages throughout the SEA from the extreme southeast up to the Rio Hondo College Wildlife Sanctuary, including mountain lion (*Puma concolor*) and a number of medium-sized mammals.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas."Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species.The Rio Hondo College WildlifeSanctuary is critical habitat for the coastal California gnatcatcher.

Sensitive Plan Communities and Habitats

The SEA supports one habitat type considered sensitive by resource agencies. This is inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.This community is coastal sage chaparral scrub and it occupies a part of the SEA.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Southern tarplant (*Centromadia parryi* ssp. *australis*)RPR 1B.1
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)RPR 1B.2

- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2
- Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*)RPR 1B.2
- Southern California black walnut (*Juglans californica*)RPR 4.2

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- Rosy boa (*Charina trivirgata*)BLMS, FSS
- Cooper's hawk (*Accipiter cooperii*)~~CDFG~~CDFW Watch List
- Burrowing owl (*Athene cunicularia*)BCC, BLMS, SSC
- Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*)BCC, FSS, SSC
- Yellow-breasted chat (*Icteria virens*)SSC
- Coastal California gnatcatcher (*Polioptila californica californica*)FT, SSC, USBC, AWL, ABC
- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Silver-haired bat (*Lasionycteris noctivagans*)WBWG Medium
- Hoary bat (*Lasiurus cinereus*)WBWG Medium
- Pocketed free-tailed bat (*Nyctinomops femorosaccus*)SSC, WBWG Medium
- Big free-tailed bat (*Nyctinomops macrotis*)SSC, WBWG Medium-High
- American badger (*Taxidea taxus*)SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE RIO HONDO WILDLIFE SANCTUARY SEA

Criterion		Status	Justification
A)	The habitat of core populations of	Met	The SEA is critical habitat for the coastal California

	endangered or threatened plant or animal species.		gnatcatcher.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Not Met	The SEA does not contain unique habitat restricted in distribution in the region of Southern California.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Not Met	The SEA does not contain unique habitat for the region of the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	This SEA is located on the eastern upland area of the San Gabriel River and is considered critical habitat for connectivity of the coastal California gnatcatcher. The largest population of the gnatcatcher in the County is on the west side of the San Gabriel River and the Interstate-605. Critical habitat in the SEA is on the east side of the San Gabriel River and the Interstate-605. The SEA is an arm extending to the rest of the gnatcatcher critical habitat and connecting to the rest of the Puente Hills SEA. TheSEA is an important connecting and migration area for plants and wildlife of the Puente-Chino Hills of the Peninsular Ranges.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The SEA is part of the education network of the public community colleges of the Los Angeles area.The area is used by the college for scientific study and research on native wildlife and plants.The college maintains field records on the biotic resources of the area.The SEA is relatively undisturbed. As a “choke point” for the wildlife corridor, it is an important area of research and study of connectivity.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	NotMet	The SEA has little disturbed areas, as well as recovering natural habitat.

In conclusion, the area described is an SEA because it contains:A) core habitat for a threatened species; D) is an important choke point in a significant migration and connective corridor of the County and the region of Southern California; and E) is an important resource to the education community of the County because of its connective status and its natural and recovering habitats.

San Andreas SEA

Location

General

The San Andreas Significant Ecological Area (SEA) is located in the western portion of the Antelope

Valley in an unincorporated area of the County.The SEA is the second largest SEA and includes many diverse habitats.This is in large part due to the northwestern area being a meeting place for several diverse biomes and wildlife corridors.There are five ecoregions that meet in this area and have biological species that extend along the SEA and San Andreas Fault in the County.These ecoregions include: California Coastal Mountains; California Central Valley; Tehachapi Mountains, which extend to the southern Sierra Nevada; San Gabriel Mountains, which extend to other ranges in the Transverse Ranges; and the Antelope Valley, which is the northwestern end of the Mojave Desert.Wildlife corridors extend along the courses of the mountain ranges, as well as along the San Andreas Fault and Garlock Fault, which provide a great variety of habitats and frequent emergent water that is important for wildlife and plant movement and connectivity.The location and orientation of the SEA coincides with a segment of the San Andreas Fault Zone. The SEA includes a small portion of the western south-facing Tehachapi foothills, which are known for wildflower field displays in years of good rainfall. The SEA goes east and south across grasslands at the western tip of the Antelope Valley, includes Quail Lake, a former sag pond enhanced to receive water from the West Branch of the California Aqueduct.From Quail Lake, the SEA extends up the northern foothills of Liebre Mountain and Sawmill Mountain, and includes: Portal Ridge; large portions of Leona Valley; Ritter Ridge, Fairmont and Antelope buttes;and portions of Anaverde Valley.It also includes a disjunct area that encompasses water bodies along the fault, Lake Palmdale, and Una Lake, with a terminus at Barrel Springs.

The Antelope Valley and adjacent desert slopes of the SEA are recognized by California Audubon as the Antelope Valley (Lancaster) Globally Important Bird Area (IBA).Near Lake Palmdale in the disjunct eastern section of the SEA is part of the Antelope Valley (Lancaster) IBA and near Barrel Springs is part of the Santa Clara River IBA.

The SEA is located at least partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles: Lebec, La Liebre Ranch, Neenach School, Fairmont Butte, Little Buttes, Liebre Mountain, Burnt Peak, Lake Hughes, Del Sur, Lancaster West, Sleepy Valley, Ritter Ridge, and Palmdale.

General Boundary and Resources Description

The northwestern tip of the SEA encompasses south-facing foothills at the western end of the Tehachapi Mountains, in the northwest corner of the County, on the eastern side of Tejon Pass.The largest extent of native perennial grassland and diverse wildflower fields occurs in this area of the County.

From the Tehachapi Foothills, the southern boundary goes south-southeast along Interstate-5, including much of Peace Valley in the Gorman area, which is the broad faulted area that includes Gorman Creek.The SEA boundary crosses the Western Branch of the California Aqueduct,which is south of the junction of Interstate-5 and State Route-138.The boundary continues south along Interstate-5 until the point where the Liebre Mountain ridgeline dips to the highway, and the SEA boundary turns eastward and follows the ridgeline along the northern side of Liebre Mountain.

Along this section of Interstate-5 are several large underpasses for stream courses that are extremely important for wildlife connectivity across Interstate-5.The Angeles National Forest boundary is just east of the highway,and south of the aqueduct. Just north of the Liebre Mountain ridgeline, the San Andreas borders the north, east, and south sides of the eight unit of the Joshua Tree Woodlands SEA. This woodland is an unnamed arroyo, and it has the clumped growth form

that Joshua trees (*Yucca brevifolia*) exhibit in hilly areas. The woodland is near the westernmost Joshua tree of the species. The woodland is a range extreme end. The SEA includes the northern slope are of the Angeles National Forest with its diversity of chaparral, grasslands, and oak and conifer forests.

After turning east from Interstate-5 and climbing uphill on the northern slope of Liebre Mountain, the SEA boundary crosses the ridgeline to the south to incorporate natural pristine areas of headwaters for all the branches of Liebre Gulch, which are part of the headwaters for Piru Creek, which is the largest tributary of the Santa Clara River in Ventura County.The SEA boundary returns to the north face of Liebre Gulch at about the location of Sandberg. The boundary tracks the Sawmill Mountain-Maxwell Road, which is generally on the broad ridgeline of the mountains and generally trends in a southeasterly direction.This ridgeline is the headwaters of Castaic Creek, which is the largest tributary of the Santa Clara River in the County. Castaic Creek is above the Castaic Reservoir, which extends into Cienega Canyon and Fish Creek, which is federally-designated critical habitat for the endangered arroyo toad (*Anaxyrus californicus*). In addition, maintenance of pure water in the source areas is critical for the species.

The boundary turns northeast where it meets Lake Hughes Road.This is an extremely important area of connectivity as the canyon along the Lake Hughes Road (Elizabeth Lake Canyon) drains to Castaic Creek and the Santa Clara River, whereas the Amargosa Creek that goes east and west from the Lake Hughes Road in the Fault valley drains to the Antelope Valley in both directions. The junction is topographically broad and well-vegetated though residential, which is excellent for wildlife connectivity in spite of a few houses.This is one of the major connective areas for the Pacific Ocean, the mountains, and the Mojave Desert. Castaic Creek is a principle tributary of the Santa Clara River, which runs to the seacoast in Ventura County.The San Gabriel Mountains are the home of Castaic Creek. The Antelope Valley receives most of the drainages from the San Andreas Fault valley.

The SEA boundary goes north at the junction with Lake Hughes Road and then skirts the Lake Hughes community's extension into Pine Canyon along the San Andreas Fault.In Pine Canyon, the boundary turns north and returns to its southeasterly direction, skirting the Lake Hughes development along the southern edge of Portal Ridge.Portal Ridge is entirely included in the SEA.A side extension of the southern boundary includes Lake Hughes, which is important for migrating waterfowl, with its sheltered position in the Fault valley.The boundary extends along the southern edge of Lake Hughes, Munz Lake, and Elizabeth Lake, and then trends southeast to go along the Leona Divide, including a large portion of Leona Valley.

The entire area along the San Andreas Fault is rich in wetlands and bogs, but Leona Valley has these in abundance, even in many yards.All of the wetlands inthe San Andreas Fault valley and Portal Ridge are home to the greatest concentration of the tricolored blackbird in Southern California, many of which are year-round residents.This bird species has experienced great population declines in recent years and is proposed for listing at both state and federal levels.In the community of Leona Valley, the southern SEA boundary goes along Lost Valley Creek and then along Leona Road to exclude some of the denser residential area in this section.The included area in Leona Valley has many of the bogs that line the Fault and the less populated farm areas along Portal Ridge north of Leona Road.

Around the area of the northward drainage of Bouquet Canyon, the southern SEA boundary dips

south around an expansive area of drainages and bogs used by the tricolor blackbird on the old Ritter Ranch.From Ritter Canyon to the east, the boundary follows the old Ritter Ranch high road along the Sierra Pelona, crosses from 40th Street to the California Aqueduct along vegetation in the Anaverde Valley (where the boundary transitions from the Amargosa Creek drainage to the Anaverde Creek drainage), and then follows the aqueduct to the area where Anaverde Creek exits from the Fault valley.At the Lancaster Landfill boundary, the SEA boundary goes north and becomes the north SEA boundary at Verde Point.

The northern boundary of the SEA begins at Tejon Pass next to Interstate-5 and follows the Kern-Los Angeles County line eastward to the intersection of the western branch of the California Aqueduct in the western Tehachapi Foothills. This area along the Kern-Los Angeles County line is a contact boundary with the designated critical habitat for the federally-endangered California condor (*Gymnogyps californicus*), which is a bird that nearly went extinct and was saved by prodigious efforts in captive breeding. The boundary turns southeast to contour along the toe of slopes of low-lying hills where some of the few remaining examples of native perennial bunchgrass communities in California are found. The boundary crossesState Route-138, just east of where Tentrock Canyon also crosses State Route-138 and turns eastward into the Antelope Valley.Here the northern SEA boundary turns east to contour along the foothill area of the northern slope of Liebre Mountain.The boundary continues southeast following the edge of agricultural fields, which are important for raptor foraging. These fields often go along the Los Angeles Aqueduct, which is a little south of the California Aqueduct in this area, or along the California Aqueduct itself.

The boundary eventually tracks along the northeast edge of Fairmont Reservoir (another breeding site for the tricolored blackbird), and turns northeast to include a patchwork of farmed areas between the Fairmont and Antelope buttes, which are known to have tricolored blackbird feeding grounds. The boundary makes an inclusive path to encompass the Broad Canyon Wash, the Fairmont and Antelope buttes, and the Antelope Valley California Poppy Reserve State Park.These desert buttes are concentrated wintering grounds for birds of prey, and provide roosting sites that are surrounded by cultivated fields that support a plentiful food supply of rodents, rabbits, and hares.They are the most westerly buttes in the Mojave Desert, and with their proximity to the San Gabriel Mountains, have unique ecological relationships of scientific interest.Near the southern area of the buttes, the boundary follows agricultural fields along 130th Street West and then 135th Street West south to Munz Ranch Road (Willow Springs Road on some maps).Along 135th Street West, the boundary crosses Myrick Canyon where it spreads out onto the plain of the desert floor.The upstream areas of Myrick Canyon are included in the SEA.

The boundary tracks along the northwest side of Munz Ranch Road and then crosses to include Willow Springs Canyon, where Willow Springs Canyon is most natural.Where Willow Springs Canyon crosses the California Aqueduct, the northern SEA boundary turns east along the California Aqueduct as it passes along the northern base of Portal Ridge.Following the southern edge of the California Aqueduct, the boundary continues in a southeasterly direction to the east side of Ritter Ridge to Leona Siphon.A development along Joshua Tree Ranch Road near the summit of Ritter Ridge is anarea exclude from the SEA. The SEA northern boundary turns east for roughly one quarter mile along the southern edge of a tributary to Amargosa Creek.Where the Amargosa Creek terminates Ritter Ridge, the SEA boundary crosses the creek and ascends along the ridgeline of an unnamed ridge to where it meets the southern boundary at Verde Point.

East across the State Route-14 is a disjunct part of the SEA that incorporates Lake Palmdale and

Una Lake and extends along the Fault to 37th Street East, including the ridgelines north and south of Barrel Springs Road, which includes the sag ponds or Barrel Springs.The Palmdale Ditch is included in this part of the SEA.Many migrant birds using the desert water features can be observed at these artificial lakes and the natural springs of this area during the spring and fall migration.

The gap between the two portions of the SEA includes the Antelope Valley Landfill, disturbed lots, and State Route-14.

The majority of land within the SEA lies within unincorporatedarea of the County.Other jurisdictions include the Angeles National Forest, the City of Palmdale, and the City of Lancaster.

Vegetation

Due to the unique location along a large fault valley that is bordered by pressure ridges, the large variation in elevation and topography, and because it includes a meeting point of large "eco-regions," vegetation within the SEA is the most diverse of any of the County's SEAs.The SEA includes arid desert communities, foothill woodland communities; high elevation piñon pine; chaparral communities; sag pond wetlands; native perennial grasslands; desert and montane riparian; and deciduous, oak, and conifer forest communities.In addition, the transition zones between these communities produce unusual species compositions.At its northwest end, the SEA encompasses a portion of the south-facing foothills of the Tehachapi Mountains, which have wildflower displays in years of good rainfall. Characteristic species include buttercup, poppy, owl's clover, lupines, and many species of sunflowers and daisies.Moving southeast, the SEA contains the north-facing slopes of Liebre and Sawmill mountains.The upper slopes of these mountains are densely vegetated with chaparral and scattered mixed woodlands.The lower slopes are more sparsely vegetated with scrub species, mixed scrub and grassland.The grassland and some ephemeral wildflower fields extend onto the plain of the valley floor.Most of the mountainous portion of the SEA is undisturbed open space, with a few scattered residential developments.The peak of Liebre Mountain represents the highest point in the SEA at 5,701 feet above mean sea level (MSL).

Moving further southeast, Portal Ridge is included in the SEA.This ridge has a series of peaks on the north side of the Fault.Upper slopes are vegetated with dense chaparral, juniper woodland, and Joshua tree woodland, while lower slopes are vegetated with scrub species and grassland.A series of small lakes (originally sag ponds along the Fault) occur along the base of the south-facing slopes including Lake Hughes, Munz Lake, Elizabeth Lake, and other smaller unnamed ponds.Further southeast, the SEA surrounds Amargosa Creek and a large portion of its watershed located in the Leona Valley.All along the north-facing slopes, a number of named and unnamed natural washes, often with flora that is sensitive and prefers watercourses, drain onto the valley floor from the mountains and the Fault.Named canyons are Tentrock; Horse Camp; Cow Spring; Pine; Spencer; Burnside; Adams; Rivera; Baldwin Grade; North Long; South Long; Kings; Bleich; Broad Wash; Price; Myrick; Willow Springs; many unnamed drainages off Portal Ridge and some off Ritter Ridge; Johnson Road Wash;and Railroad. Also included are Godde Pass Wash, Amargosa Creek, and Anaverde Creek.The vegetation transitions to grasslands and wildflower fields, where the SEA stretches north across the valley floor and encircles the Antelope and Fairmont buttes of the Antelope Valley California Poppy Reserve.Numerous large "bald" areas in the higher elevations have grasslands bordered by shrublands or forests.

The mountainous part of the SEA has an extremely diverse flora, which arises because of its topographic diversity and because of its connectivity to the western end of the SEA.This area is a

meeting place for five diverse ecoregions and two or more wildlife corridors. Because of the great vegetation diversity, the area provides an opportunity for educational use, nature study, and scientific research.Foothill woodland extends from the western end of the SEA, all the way to Ritter Ridge, which is an uncommon plant community that contains oak savannahs of blue oak (*Quercus douglasii*) and valley oak (*Quercus lobata*), and gray pine woodland (*Pinus sabiniana*).This community is more common in northern and central California, where it occurs along foothill and valley borders in the inner coastal ranges and western foothills of the Sierra Nevada.This is the only place it occurs inthe County.Several component species, such as blue oak, gray pine, and California buckeye (*Aesculus californica*) reach their southern limits here.Slopes and ridge-tops are covered with chaparral and yellow-pine forest, which becomes pinyon-juniper woodland under desert influences on the lower northern slopes.Joshua tree woodland and sagebrush scrub cover the lower desert hillsides.

On the lower slopes and in the valleys south of the main ridgeline, one can find southern oak woodland, valley grassland, riparian woodland, sagebrush scrub, and even coastal sage scrub.All of these are relatively common in the County with the exception of sagebrush scrub.This community, which is dominated by Great Basin sage (*Artemisia tridentata*), is not common south of the Owens Valley in California.Populations in Southern California are probably relics from a prehistoric time when the community extended much further south than it does today.

Ritter Ridge comprises the most easterly portion of the San Gabriel Mountains in the SEA.Slopes on the north side of this ridgeline are vegetated with one of the best Joshua tree and California juniper mixed woodlands in the County.The combination of desert chaparral and foothill woodlands creates habitat for a rich faunal list, with 25 mammals, 53 birds and 19 reptiles recorded.South-facing slopes contain a mixture of scrub and chaparral communities.This section of the SEA includes Amargosa Creek and a portion of its watershed, which is located at the base of the south-facing slopes, and a segment of Anaverde Creek and watershed located in Anaverde Valley.All these creeks and washes support a variety of riparian communities.

The disjunct part of the SEA that includes Palmdale Lake, Una Lake, and Barrel Springs has upland portions vegetated with a desert scrub community with scattered Joshua trees.The lower areas consist of open water ponds, cattail ponds, riparian woodlands, and other wetland communities.

Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.*Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA are presented below.These include desert scrub, chaparral, native grassland, non-native grassland, southern willow scrub, foothill woodland, Joshua tree woodland, juniper woodland, valley oak woodland, bigcone Douglas fir-canyon oak woodland, southern cottonwood-willow riparian forest, freshwater marsh, alkali marsh, alluvial wash, and disturbed.

Desert Scrub:A moderately tall, fairly open shrubland with several species that contribute to the canopy.Dominants often include Great Basin sagebrush, antelope bush, saltbush, and/or rabbitbrush with several perennial grasses dispersed between the shrubs.Within the SEA, thiscommunity often intergrades with juniper woodlands and Joshua tree woodlands.Desert scrub is also found on lower slopes within the Fault, on north-facing slopes that transition onto the valley floor. They are also

found on the buttes and adjacent valley floor, interspersed with grasslands.

Corresponding MCV communities:

- Krascheninnikovia lanata (winterfat scrubland) Shrubland Alliance
- *Suaeda moquinii* ([*Suaeda nigra*] bush seepweed scrub) Shrubland Alliance
- *Atriplex spinifera* (spinescale scrub) Shrubland Alliance
- *Pluchea sericea* (arrow weed thickets) Shrubland Alliance
- *Artemisia tridentata* (big sagebrush) Shrubland Alliance
- *Artemisia tridentata* ssp. *vaseyana* (mountain big sagebrush) Shrubland Alliance
- *Atriplex canescens* (fourwing saltbush scrub) Shrubland Alliance
- *Atriplex confertifolia* (shadscale scrub) Shrubland Alliance
- *Atriplex hymenelytra* (desert holly scrub) Shrubland Alliance
- *Atriplex lentiformis* (quailbush scrub) Shrubland Alliance
- *Acacia greggii* (catclaw acacia thorn scrub) Shrubland Alliance
- *Ericameria paniculata* (black-stem rabbitbrush scrub) Shrubland Alliance
- *Ambrosia salsola* (cheesebrush scrub) Shrubland Alliance
- *Baccharis salicifolia* (mulefat thickets) Shrubland Alliance
- *Larrea tridentata* (creosote bush scrub) Shrubland Alliance
- *Larrea tridentata-Ambrosia dumosa* (creosote bush-white burr sage scrub) Shrubland Alliance
- *Atriplex polycarpa* (allscale scrub) Shrubland Alliance
- *Atriplex spinifera* (spinescale scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub)Shrubland Alliance
- *Eriogonum heermannii* (Heermann’s buckwheat patches) Provisional Shrubland Alliance
- *Eriogonum wrightii* (Wright’s buckwheat patches)Dwarf Shrubland Alliance
- *Ephedra californica* (California joint fir scrub) Shrubland Alliance
- *Allenrolfea occidentalis* (iodine bush scrub) Shrubland Alliance

- *Sarcobatus vermiculatus* (greasewood scrub) Shrubland Alliance
- *Yucca brevifolia* (Joshua tree woodland) Woodland Alliance
- *Prosopis glandulosa* (mesquite bosque) Woodland Alliance
- *Ambrosia salsola* (cheesebush scrub) Shrubland Alliance
- *Grayia spinosa* (spiny hop sage scrub) Shrubland Alliance
- *Castela emoryi* (crucifixion thorn stands) Shrubland Special Stands
- *Ericameria nauseosa* (rubber rabbitbrush scrub) Shrubland Alliance
- *Gutierrezia sarothrae* (broom snake weed scrub) Provisional Shrubland Alliance
- *Ambrosia dumosa* (white bursage scrub) Shrubland Alliance
- *Eriogonum fasciculatum-Salvia apiana* (California buckwheat-white sage scrub) Shrubland Alliance
- *Lepidospartum squamatum* (scale broom scrub) Shrubland Alliance
- *Purshia tridentata* (bitter bush scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub) Shrubland Alliance

Chaparral: Consists of broad-leafed or needle-leafed, sclerophyllous (hard-leafed), medium height to tall shrubs.These shrubs form a dense cover on steep slopes below 5,000 feet in Southern California.Dominant species found within this community include chamise, manzanita, California lilac, laurel sumac, toyon, western mountain-mahogany, and desert mountain-mahogany.This plant community occupies most of the higher elevations within the SEA and is frequently interspersed with scrub and woodlands.

Corresponding MCV communities:

- Adenostoma fasciculatum (chamise chaparral) Shrubland Alliance
- *Adenostoma fasciculatum-Salvia apiana* (chamise-white sage chaparral) Shrubland Alliance
- *Arctostaphylos glandulosa* (Eastwood's manzanita chaparral) Shrubland Alliance
- *Arctostaphylos glauca (*bigberry manzanita chaparral) Shrubland Alliance
- *Ceanothus spinosus* (greenbark ceanothus chaparral) Shrubland Alliance

- *Ceanothus oliganthus* (hairy leaf ceanothus chaparral) Shrubland Alliance

- *Prunus ilicifolia* (holly leaf cherry chaparral) Shrubland Alliance

Grassland: Consist of low, herbaceous vegetation that is dominated by grasses, but also harbors native forbs and bulbs, as well as naturalized annual forbs. Grasslands within the SEA include both non-native and native grasslands.

Native grassland consists of at least 10 percent relative cover of native herbaceous plants (grasses and forb species), with the remaining coverage similar to non-native grasslands. North of Quail Lake there are areas where native perennial bunchgrasses and wildflowers dominate. In addition, introduced annual grasses are conspicuously limited. Small patches of native grassland can also be found scattered throughout the SEA. This occurs mostly in openings in coastal sage scrub and mixed with non-native grasslands in significant acreage on and surrounding the buttes, as well as throughout the Tehachapi foothills at the western end of the SEA. The Tehachapi foothills are part of an expansive perennial grassland. Many areas of native grassland, such as those surrounding the buttes, support dense displays of wildflowers, which have carpeted the area in some years and are referred to as “wildflower fields.”

Corresponding MCV communities:

- Leymus condensatus (giant wild rye grassland) Herbaceous Alliance

- *Nassella cernua* ([*Stipa cernua*] nodding needle grass grassland) Provisional Herbaceous Alliance

- *Nassella lepida* ([*Stipa lepida*] foothill needle grass grassland) Provisional Herbaceous Alliance

- *Nassella pulchra* ([*Stipa pulchra*] purple needle grass grassland) Herbaceous Alliance

Non-native grassland consists of dominant invasive annual grasses that are primarily of Mediterranean origin. Dominant species found within this community include slender oats, wild oats, ripgut brome, foxtail chess, wild mustard, red-stemmed filaree, Mediterranean schismus, and golden tops. Non-native grasslands are located in small patches throughout the SEA, within more significant acreage on and adjacent to the buttes, and on south-facing slopes of the Tehachapi Mountains.

Corresponding MCV communities:

- *Avena (barbata, fatua)* (wild oats grasslands) Semi-Natural Herbaceous Stands

- *Brassica (nigra)* and other mustards (upland mustards) Semi-Natural Herbaceous Stands

- *Bromus (diandrus, hordeaceus)-Brachypodium distachyon* (annual brome grasslands)Semi-Natural Herbaceous Stands

- *Bromus rubens-Schismus (arabicus, barbatus)* ([*Bromus madritensis* ssp. *rubens*] Red brome or Mediterranean grass grasslands)Semi-Natural Herbaceous Stands

- *Lolium perenne* ([*Festuca perennis*] perennial rye grass fields) Semi-Natural Herbaceous Stands

Wildflower Field:An amorphous mix of herbaceous plants noted for conspicuous annual wildflower displays, although noteworthy displays do not occur every year and appear to depend on rainfall patterns.Dominance varies from site to site and from year to year at any one particular site.Species frequently present include California poppy, tidy tips, dove lupine, valley tassels, purple owl's clover, and broad-leaved gilia.Within the SEA, prominent wildflower fields occur on the south facing slopes of the Tehachapi Mountains and buttes.

Corresponding MCV communities:

None at this time.

Southern Willow Scrub:A riparian community consisting of dense, broad-leafed, winter-deciduous riparian thickets that occur within and adjacent to watercourses.The dominant species of this community within the SEA are arroyo willow, red willow, and black willow.This community occurs in segments along portions of many of the drainages, as well as the periphery of many of the ponds and lakes throughout the SEA.

Corresponding MCV communities:

- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance
- *Salix exigua* (sandbar willow thickets) Shrubland Alliance
- *Salix gooddingii* (black willow thickets) Woodland Alliance

Foothill Woodland:A broad community designation encompassing the tree-dominated plant communities occurring transitionally between grasslands and montane chaparral or bigcone Douglas fir-canyon oak woodland.Dominant tree species include interior live oak, blue oak, valley oak, California buckeye, and foothill pine.Foothill woodland occupies much of the western slopes of the SEA.

Corresponding MCV communities:

- Pinus jeffreyi (Jeffrey pine forest) Forest Alliance
- *Pinus ponderosa* (Ponderosa pine forest) Forest Alliance
- *Quercus lobata* (valley oak woodland) Woodland Alliance
- *Abies concolor-Pinus lambertiana* (white fir-sugar pine forest) Forest Alliance
- *Abies concolor* (white fir forest) Forest Alliance
- *Pseudotsuga macrocarpa* (bigcone Douglas-fir forest) Forest Alliance
- *Quercus douglasii* (blue oak woodland)Woodland Alliance

- *Umbellularia californica* (California bay forest) Forest Alliance
- *Quercus kelloggii* (California black oak forest) Forest Alliance
- *Aesculus californica* (California buckeye groves) Woodland Alliance
- *Quercus chrysolepis* (canyon live oak forest) Forest Alliance
- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance
- *Pinus coulteri* (Coulter pine woodland) Woodland Alliance
- *Pinus sabiniana* (ghost pine woodland) Woodland Alliance
- *Quercus wislizenii* (interior live oak woodland) Woodland Alliance

Joshua Tree Woodland:An open woodland with Joshua trees, usually as the only arborescent species, and numerous smaller shrub species interspersed between.Shrub species include a great variety with dominants of Great Basin sagebrush, rabbitbrush, creosote bush, and cheese bush.Joshua tree woodland is present on the lower slopes around the Fault in the eastern half of the SEA.

Corresponding MCV communities:

- *Yucca brevifolia* (Joshua tree woodland) Woodland Alliance

Juniper Woodland:An extremely open woodland dominated by California juniper, with understory that is typical of desert scrub.The majority of this community is found on lower slopes in the eastern half of the SEA, and often intermingles with Joshua tree woodland and chaparral communities.

Corresponding MCV communities:

- Juniperus californica (California juniper woodland) Woodland Alliance

Valley Oak Woodland:An open woodland community dominated by valley oak.The understory is a grassy savannah that is composed mostly of non-native grasses.Valley oak woodland occurs on the north-facing slope of Liebre Mountain in the western area of the SEA.

Corresponding MCV communities:

- Quercus lobata (valley oak woodland) Woodland Alliance

Bigcone Douglas Fir-CanyonOak Woodland:A dense woodland with a mix of dominant tree species.Canyon oak forms a broken canopy with scattered bigcone Douglas fir, California black oak, and foothill pine.Areas not underneath the canopy are usually dominated by chaparral species, such as scrub oak, manzanita, and California lilac.This community occupies most of the higher elevation slopes within the SEA.

Corresponding MCV communities:

- Pseudotsuga macrocarpa (bigcone Douglas-fir forest) Forest Alliance
- Quercus chrysolepis (canyon live oak forest) Forest Alliance

Southern Cottonwood-Willow Riparian Forest:An open broad-leafed winter-deciduous riparian forest dominated by Fremont cottonwood, black cottonwood, black willow, and red willow.The southern cottonwood-willow riparian forest within the SEA occupies short segments of Amargosa Creek, as well as the periphery of several lakes and ponds.

Corresponding MCV communities:

- *Populus fremontii* (Fremont cottonwood forest) Forest Alliance
- *Populus trichocarpa* (black cottonwood forest) Forest Alliance

Freshwater Marsh:Develops in areas of still or slow-moving permanent freshwater.This community is dominated by the perennial, emergent monocot cattails, which reach a height of two to three meters and often form a closed canopy.Bulrushes are dominant below the cattail canopy.Freshwater marsh occurs in small patches along Amargosa Creek and other wetland areas scattered along the Fault.

Corresponding MCV communities:

- *Phragmites australis* (common reed marshes) HerbaceousAlliance and Semi-Natural Stands
- Schoenoplectus californicus (California bulrush marsh) Herbaceous Alliance
- *Typha (angustifolia, domingensis, latifolia)* (cattail marshes) Herbaceous Alliance
- *Sarcocornia* [*Salicornia*]*pacifica* (*Salicornia depressa*)(pickleweed mats) Herbaceous Alliance
- *Lemna (minor) and relatives* (duckweed blooms) Provisional Herbaceous Alliance

Alkali Marsh:Similar to the freshwater marsh, but with more salt-tolerant hydrophytes present.Species associated with this community include cattails, *Carex* spp., *Juncus cooperi*, saltgrass, *Nitrophila occidentalis*, *Scirpus nevadensis*, and common reed.Alkali marsh occurs in small segments along Amargosa Creek and other wetland areas scattered along the Fault.

Corresponding MCV communities:

- Sarcobatus vermiculatus (greasewood scrub) Shrubland Alliance
- *Schoenoplectus americanus* (American bulrush marsh) HerbaceousAlliance
- *Sporobolus airoides* (alkali sacaton grassland)Herbaceous Alliance
- *Allenrolfea occidentalis* (iodine bush scrub) Shrubland Alliance
- *Atriplex lentiformis* (quailbush scrub) Shrubland Alliance
- *Suaeda moquinii* ([*Suaeda nigra*] bush seepweed scrub) Shrubland Alliance

Alluvial Wash: Also known as floodplain sage scrub, alluvial wash comprises phreatophytic (a plant type that obtains water from the watertable via a long taproot) and upland shrubs that occur in infrequently flooded and scoured habitats such as flood plains, or seasonal streams.The dominant shrub is scalebroom with Great Basin sagebrush, rabbitbrush, sweetbush, and chaparral yucca.Alluvial wash is distributed in larger drainages such as upper Amargosa Creek, Myrick Canyon Wash, Willow Springs Wash and others located throughout the SEA.

Corresponding MCV communities:

- Baccharis salicifolia (mulefat thickets) Shrubland Alliance
- *Forestiera pubescens* (desert olive patches) Shrubland Alliance
- *Rosa californica* (California rose briar patches)Shrubland Alliance
- *Salix exigua* (sandbar willow thickets) Shrubland Alliance
- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance
- *Acacia greggii* (catclaw acacia thorn scrub) Shrubland Alliance
- *Ephedra californica* (California joint fir scrub) Shrubland Alliance
- *Ericameria paniculata* (black-stem rabbitbrush scrub) Shrubland Alliance
- *Lepidospartum squamatum* (scale broom scrub) Shrubland Alliance
- *Ericameria nauseosa* (rubber rabbitbrush scrub) Shrubland Alliance
- *Ericameria nauseosa-Ericameria teretifolia* (needleleaf rabbitbrush scrub) Shrubland Alliance
- *Gutierrezia sarothrae* (broom snake weed scrub) Provisional Shrubland Alliance

Disturbed or Barren Areas: Areas that either completely lack vegetation or are dominated by ruderal species.Ruderal vegetation typically found within the SEA includes non-native grasses and “weedy” herbaceous species, native and non-native, including mustards, telegraph weed, Russian thistle, dock, yellow star thistle, Australian saltbush, and cocklebur.Several disturbed areas occur scattered throughout the SEA and take the form of residential developments, paved roads, fire breaks, dirt access roads, trails, and other similarly disturbed areas.

Wildlife

Wildlife within the SEA is diverse and abundant due to the large acreage of natural open space and the diversity of habitat types.While a few wildlife species are entirely dependent on a single vegetative community, the entire mosaic of all the vegetation communities within the SEA and adjoining areas constitutes a functional ecosystem.This ecosystem contains a variety of wildlife species, both within the SEA and as part of the regional ecosystem.

Analysis of invertebrates on any given site is generally limited by a lack of specific data; however,

the size of the SEA and diversity of habitats present is considered sufficient to encompass healthy populations of a large number of invertebrate species. The wetlands and aquatic habitats within the SEA support diverse faunas of freshwater and alkaline pool arthropods, including native fairy shrimp, brine flies, and tiger beetles. Vernal pools, which are a sensitive habitat, are being discovered and would be expected in a heavily faulted area with many depressions created by faulting. These would not have typical through-flow of erosional features. Vernal pools often have sensitive fauna and flora.Insect orders are particularly well-represented taxonomically, with moderate levels of species endemism including coleoptera, diptera, hymenoptera and diurnal and nocturnal lepidoptera.

Amphibian populations are generally scarce in desert habitats, but may be particularly abundant where desert riparian areas occur or in the mountains.The SEA is likely to support a variety of amphibians within wetland areas along the Fault and the moister woodland areas and canyon bottoms of the mountains.Many essential reptilian habitat characteristics are present within the SEA.These include open habitats that allow free movement and high visibility, and small mammal burrows for cover and escape from predators and extreme weather.These characteristics, as well as a diversity of habitat types are likely to support a wide variety of reptilian species.

The scrubland, woodland, riparian, and grassland habitats in the SEA provide foraging and cover habitat for year-round residents, seasonal residents, and migrating song birds.In addition, the SEA encompasses many year-round water sources, abundant raptor foraging, perching, and nesting habitat.The combination of these resources, as well as the confluence of many community types support an unusually high diversity of bird species. Small and large mammal populations within the SEA are diverse and reflective of the unique convergence of several habitat types.

All wildlife species previously recorded, as well as those expected to occur, within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEAs*.Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources.

Wildlife Movement

The SEA includes several important linkages for wildlife movement.The foothills in the western-most part of the SEA are an important linkage between the San Gabriel Mountains, the Tehachapi Mountains, and the Coastal Ranges.This linkage to the Tehachapi Mountains is important because they connect to the southern-most extent of the Sierra Nevada Mountains. The Tehachapi Mountains represent the only mountain linkage from the Transverse Ranges and the Coast Ranges to the Sierra Nevada Range.This feature may be an important topographic reference for migrating birds, as well as providing high elevation foraging grounds along the migratory route.The several ranges that meet at the western end of the SEA, and provide a valuable link for gene flow between divergent populations of many species.The SEA includes numerous drainages that extend onto the Antelope Valley floor towards resources, such as the Fairmont and Antelope buttes.These washes provide an important linkage for animals traveling between the Valley floor, the buttes and the western part of the San Gabriel Mountains.In addition, Anaverde Creek, Amargosa Creek, and Pine Canyon facilitate east-west wildlife movement through the mountains, Portal Ridge, and Ritter Ridge.Tributary drainages from the Santa Clara River, such as Elizabeth Lake Canyon and San Francisquito Canyon connect the ocean and coastal zones to the Fault.The frequency of valuable riparian communities along this travel route, whichare located within an otherwise arid climate, further contributes to the SEA's importance for wildlife and habitat linkages in the region.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas."Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species.

Sensitive Plan Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.The communities include Joshua tree woodland, valley oak woodland, native grassland, wildflower field, southern cottonwood-willow riparian forest, fresh-water swamp, alkali meadow, and southern willow scrub, and all these occur throughout the SEA.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Nevin's barberry (*Berberis nevinii*) FE, SE, RPR 1B.1
- San Fernando Valley spineflower (*Chorizanthe parryi* var*. fernandina*) FC, SE, RPR 1B.1

In addition, the following species considered by CNPS to be rare, threatened or endangered have the potential to occur:

- Lancaster milk-vetch (*Astragalus preussii* var*. laxiflorus*) RPR 2.3

- Slender mariposa lily (*Calochortus clavatus* var*. gracilis*) RPR 1B.2
- Alkali mariposa lily (*Calochortus striatus*) RPR 1B.2
- Pierson's morning glory (*Calystegia peirsonii*) RPR 4.2
- Parry's spineflower (*Chorizanthe parryi* var*. parryi*) RPR 1B.1
- San Gabriel bedstraw (*Galium grande*) RPR 1B.2
- Plummer's mariposa lily (*Calochortus plummerae*) RPR 1B.2
- Robbins' nemacladus (*Nemacladus secundiflorus* var*. robbinsii*) RPR 1B.2
- Short-joint beavertail (*Opuntia basilaris* var*. brachyclada*) RPR 1B.2
- San Bernardino aster (*Symphyotrichum defoliatum*) RPR 1B.2

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Arroyo toad (*Anaxyrus californicus*)FE, SSC
- California red-legged frog (*Rana draytonii*) FT, SSC
- Western pond turtle (*Emys marmorata*) BLMS, SSC, FSS
- San Diego coast horned lizard (*Phrynosoma blainvillii*) BLMS, SSC, FSS
- Coast patch-nosed snake (*Salvadora hexalepis virgultea*) SSC
- Western yellow-billed cuckoo (*Coccyzus americanus* ssp. *occidentalis*)FC,FSS, BCC
- Willow flycatcher (*Empidonax traillii*) SE
- Southwestern willow flycatcher (*Empidonax traillii extimus*)FE, SE, ABC
- California condor (*Gymnogyps californianus*)FE, SE, ABC, CDF
- American peregrine falcon (*Falco peregrinus anatum*) FD, SDCDF, ~~CDFG~~CDFW Fully Protected, BCC
- Least Bell's vireo (*Vireo bellii pusillus*) FE, SE, ABC
- Mohave ground squirrel (*Xerospermophilus mohavensis*) ST

In addition, other state-listed species of concern have the potential to occur:

- Western spadefoot (*Spea hammondii*)BLMS, SSC
- Tehachapi slender salamander (*Batrachoseps stebbinsi*) ST, BLMS, FSS
- Silvery legless lizard (*Anniella pulchra pulchra*) SSC, FSS
- Two-striped garter snake (*Thamnophis hammondii*)
- Cooper's hawk (*Accipiter cooperii)* ~~CDFG~~CDFW Watch List
- Sharp-shinned hawk (*Accipiterstriatus*) ~~CDFG~~CDFW Watch List
- Tricolored blackbird (*Agelaius tricolor*)ABC, BLMS, SSC, BCC
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*) ~~CDFG~~CDFW Watch List
- Long-eared owl (*Asio otus*) SSC
- Burrowing owl (*Athene cunicularia*) BLMS, SSC, BCC
- California spotted owl (*Strix occidentalis occidentalis*),
- Ferruginous hawk (*Buteo regalis*) ~~CDFG~~CDFW Watch List, BCC
- Mountain plover (*Charadrius montanus*) FPT, ABC, BLMS, SSC, BCC
- Northern harrier (*Circus cyaneus*) SSC
- Yellow warbler (*Dendroica petechia* ssp. *brewsteri*) SSC, BCC
- White-tailed kite (*Elanus leucurus*) ~~CDFG~~CDFW Fully Protected
- Merlin (*Falco columbarius*) ~~CDFG~~CDFW Watch List
- Prairie falcon (*Falco mexicanus*) ~~CDFG~~CDFW Watch List, BCC
- Bald eagle (*Haliaeetus leucocephalus*) FD, SE, CDF, ~~CDFG~~CDFW Fully Protected, FSS, BCC
- Yellow-breasted chat (*Icteria virens*) SSC
- Western least bittern (*Ixobrychus exilis hesperis*) SSC, BCC
- Loggerhead shrike (*Lanius ludovicianus*) SSC, BCC
- Golden eagle (*Aquila chrysaetos)* CDF, ~~CDFG~~CDFW Fully Protected, ~~CDFG~~CDFW Watch List, BCC
- Osprey (*Pandion haliaetus*) CDF, ~~CDFG~~CDFW Watch List

- Le Conte's thrasher (*Toxostoma lecontei*) ABC, SSC, BCC
- Gray vireo (*Vireo vicinior*) ABC, BLMS, SSC, BCC
- Virginia's warbler (*Oreothlypis virginiae*) ABC, ~~CDFG~~CDFW Watch List, BCC
- Pallid bat (*Antrozous pallidus*) BLMS, SSC, FSS, WBWGHigh Priority
- Townsend's big-eared bat (*Corynorhinus Plecotus) t. townsendii*) BLMS, SSC, FSS, WBWGHigh Priority
- Pale big-eared bat (*Corynorhinus Plecotus) t. townsendii pallescens*) BLMS, SSC, FSS, WBWGHigh Priority
- Spotted bat (*Euderma maculatum*) BLMS, SSC, WBWGHigh Priority
- Western mastiff bat (*Eumops perotis californicus*) BLMS, SSC, WBWGHigh Priority
- California leaf-nosed bat (*Macrotus californicus*) BLMS, SSC, FSS, WBWGHigh Priority
- Yuma myotis (*Myotis yumanensis*)BLMS, WBWGLow-Medium Priority
- Southern grasshopper mouse (*Onychomys torridus ramona*) SSC
- Tehachapi pocket mouse, (*Perognathus alticolus inexpectatus*) SSC, FSS
- American badger (*Taxidea taxus*) SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE SAN ANDREAS SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Not met Met inFuture?	Although there are several listed species that occur within the SEA, this criterion is not met due to the lack of known core population areas. The far northwestern border with Kern Countyis the edge of critical habitat for the California condor. The tricolored blackbird may soon be listed and has its largest population in Southern Californiawithin the SEA.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique	Met	The SEA encompasses a series of marshes and sinks concentrated along the San Andreas Fault Zone, which are both unique and restricted in distribution.The Fairmont and Antelope buttes represent a unique habitat due to their

Criterion		Status	Justification
	or are restricted in distribution.		location, as the most westerly buttes of the Mojave Desert and their close proximity to several geographic regions.As the confluence of a number of major geographical areas, the Mojave Desert, the San Gabriel Mountains of the Transverse Ranges, the Coastal Ranges, and the Tehachapi Mountains produces a unique and regionally rare flora that represents a transition between desert, foothill, and several montane environments.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The confluence of five major geographical areas–the Mojave Desert, the San Gabriel Mountains, the Coastal Ranges, the Tehachapi Mountains, and the Central Valley–has produced the most unique and diverse flora found in the County, and represents a transition between desert, foothill, and montane environments.The SEA also includes the southern limit of the foothill woodland community, blue oak, gray or foothill pine, and California buckeye, rare relic stands of Great Basin sagebrush scrub, and rare wildflower fields.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The Fairmont and Antelope buttes provide vital habitat to many wide ranging species, which forage in outlying habitat, but use the buttes for nesting, roosting, denning, and refuge.The buttes also serve as concentrated wintering grounds for birds of prey, which are rare in the County, and which forage on grassland and agricultural fields in the vicinity.Lakes and other wetland areas along the Fault and throughout the SEA provide breeding habitat for amphibians and feeding habitat for migrating birds that traverse the slopes adjacent to the Mojave Desert. The Fault is one of the principle wildlife corridors and connective areas for in the County. Major drainages (Santa Clara River, San Francisquito Canyon, and Lake Elizabeth Canyon) run from the coast through the San Gabriel Mountains and end at the Fault, which also has extensive riparian habitat that facilitates migration. The Fault provides the final westernmostlinkage to the Mojave Desert (Antelope Valley).The tricolored blackbird is a year-round resident of the SEA.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The transition of several habitat types including: creosote bush scrub, Joshua tree/California juniper mixed woodland, and desert chaparral, makes the SEA valuable for educational and scientific reasons.The close proximity of the Fairmont and Antelope buttes to the San Gabriel Mountains renders them unique in their species composition and ecological relationships and, therefore, of interest to scientists.The concentrated diversity of vegetation types, particularly in the western half of the SEA, creates an outstanding opportunity for educational use.This area also harbors the southern limit of the foothill woodland community, blue oak, gray or foothill pine, and California buckeye, as well

Criterion		Status	Justification
			as rare relic stands of great basin sagebrush scrub.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The slopes of Ritter Ridge support one of the most pristine mixed stands of Joshua tree and California juniper.The location of theSEA at the confluence of five major geographical areas, the Mojave Desert, the Central Valley, the San Gabriel Mountains of the Transverse Ranges, the Coastal Ranges, and the Tehachapi Mountains has produced a community-rich area with desert, foothill, and montane environments.The SEA encompasses large, mostly undisturbed examples of all of these communities.

In conclusion, the area is an SEA because it contains: B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, and migrating grounds, which are limited in availability in the County; E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

San Dimas Canyon and San Antonio Wash SEA

Location

General

The San Dimas Canyon and San Antonio Wash Significant Ecological Area (SEA) is located along the cismontane foothills of the eastern San Gabriel Mountains.Generally, the SEA is centered on the mouths of four major canyons, which flow from the mountains and interconnecting terrain.From east to west, these canyons include San Antonio Canyon above the City of Claremont as one component; and Live Oak, Marshall, and San Dimas canyons above the cities of La Verne and San Dimas as a second component. The SEA incorporates areas with diverse natural habitat ranging from high elevations to the foothill alluvial areas of two of the major drainages of the San Gabriel Mountains. San Dimas Canyon is a tributary of the San Gabriel River. San Antonio Wash is a tributary of the Santa Ana River.

The SEA is found within the Mount Baldy and Ontario U.S. Geological Survey (USGS) 7.5' California Quadrangles.

General Boundary and Resources Description

Over most of its boundaries, particularly to the north, east, and west of both the San Dimas Canyon and San Antonio Wash components, the SEA is bordered by open space within the Angeles National Forest.Generally to the south, however, the borders are mostly defined by the edge of urban development within the San Gabriel Valley. The San Dimas Canyon component covers approximately 5,500 acres and includes portions of Live Oak, Marshall, and San Dimas canyons.The

smaller component, San Antonio Canyon, covers approximately 1,200 acres of the San Antonio Canyon alluvial outwash.In total, this SEA encompasses 6,727 acres.

In general, the topography of the SEA is severe, consisting of steep-walled canyons and narrow ridgelines.Elevations range from a high of approximately 3,000 feet above mean sea level (MSL) along the ridges of San Dimas Canyon, to a low of approximately 451 feet above MSL in San Antonio Wash.Several major drainages and numerous tributaries exit the San Gabriel Mountains through this SEA.

The wide range of elevation, topography, slope aspect, and geology represent a wide array of physical habitats within this SEA.Consequently, a number of plant communities exist, including grasslands, riparian, shrublands, woodlands, and forests.Within these major community types, there are many sub-communities, which vary according to plant species dominance.This area contains the last remaining relatively well-developed lower montane riparian habitat in the eastern County. Dammed drainages have created significant reservoirs or flood control basins in the SEA.The SEA is within several jurisdictions including:the Angeles National Forest, the unincorporated area of the County, the City of Claremont, the City of Glendora, the City of La Verne, and the City of San Dimas.

The more westerly component of this SEA generally includes portions of the lower watersheds of San Dimas, Marshall, and Live Oak canyons, which is part of the San Dimas Canyon component. The San Dimas Canyon watershed is part of the Experimental Forest section of the Angeles National Forest.Experiments were conducted and data was collected here during the latter half of the 20th century to determine the relationships among rainfall, topography, vegetation, and runoff.Much of the work and results influenced flood control in the Los Angeles Basin and even other areas of the U.S.The area was carefully protected through very limited and monitored access.The terrain chiefly includes undisturbed natural habitats of rocky canyon walls and canyon forest, riparian areas of many vegetation types, coniferous and oak forest, chaparral, and grassland.A few slopes were altered with vegetation removal in order to experiment on the effect of vegetation, and some of these are still grassland.

This SEA area on the border of the granitic San Gabriel Mountains has unusual rock strata, such as the Glendora Volcanics.Much of the grassland is natural and has unusual vegetation, such as wildflowers that prefer clay substrates.Not too distant from this area arecritical habitat areas for the endangered thread-leaved brodiaea (*Brodiaea filifolia*).Some of these brodiaea and other rare wildflowers could occur in appropriate habitat of the SEA in undiscovered populations.

Beginning at Johnstone Peak in the west, the western boundary follows the ridgeline separating Big Dalton Canyon and San Dimas Canyon.Just before this ridgeline is intersected by Big Dalton Canyon Road, the SEA boundary turns east.From the area of Big Dalton Canyon Road, the northern boundary follows and crosses over a series of ridgelines to include the upper portions of several tributary canyons.It continues in this fashion in a southeasterly direction eventually meeting and following the Sunset Ridge Fire Road (Sunset Peak Motorway), which separates Wolfskill and Marshall canyons.The tributaries San Dimas Canyon include Lodi, West Fork of San Dimas, and San Dimas from near the junction with Wolfskill Canyon.The lower section of Wolfskill Canyon with and below the Wolfskill Falls is included in the SEA.The upper section of Wolfskill is not included in the SEA, but much of Marshall Canyon watershed is included, along with watersheds of Live Oak and Webb canyons in the City of Claremont.

A large lobe of the SEA extends from the Sunset Ridge Fire Road on the dividing ridgeline, to

include lush canyon forests and chaparral of the slopes above the City of La Verne and City of Claremont.Most of this lobe is in municipal or private ownership.The Angeles National Forest boundary is about a 0.1 mile south of the Sunset Ridge Fire Road.The eastern boundary leaves the fire road and travels south along a ridgeline, including Live Oak Canyon in the SEA, but separating out the more developed watersheds of Palmer, Cobal, Burbank, and Gail canyons in the City of Claremont.A finger of the SEA includes the lush riparian oak forest of Webb Canyon to the edge of adevelopment.The lobe of the SEA excludes an area around the residences and equestrian areas that surround Live Oak Reservoir.Live Oak Canyon Reservoir and its riparian oak woodland is included as far south as Base Line Road.The ridges and dissected canyons that border Live Oak Reservoir are included as far south as Base Line Road.However, the flat area of the ridge around Live Oak Reservoir and development in the periphery are excluded.The northwestern edge of the lobe includes the riparian area and slopes of Marshall Creek, but excludes developed areas, such as the Marshall Canyon Regional Park and Golf Course.The lobe boundary returns north into the Angeles National Forest at the Sunset Ridge Fire Road along the edge of Marshall Creek and the western ridge of Marshall Canyon.

From Sunset Ridge Fire Road, the southern boundary of the SEA is within the Angeles National Forest and follows the ridgeline that includes the watershed of San Dimas Canyon.The San Dimas Reservoir, with good habitat for waterfowl, is included in the SEA.The SEA extends a finger out of the Angeles National Forest along San Dimas Canyon road to include the riparian habitat along the watercourse, which is a rare example of the lowland riparian community.From the Angeles National Forest boundary and rocky cliffs above the west side of San Dimas Canyon, the SEA boundary follows the ridge of Lodi Canyon (tributary of San Dimas Canyon) to Johnstone Peak.

The eastern, disjunct segment of the SEA (San Antonio Wash) follows the San Bernardino-Los Angeles County line as its eastern boundary from about a 0.5 mile upstream of the San Antonio Dam through the San Antonio debris basin, past the San Antonio Dam, to the natural extent of alluvial fan vegetation south of the Interstate-210. This is at an area about a 0.1 mile north of Base Line Road.Downstream of the San Antonio Dam has the best example of arroyo or wash vegetation that remains in the County, and it extends onto the adjacent alluvial fan.The vegetation is a dry form of coastal sage scrub, with included desert plants that are adapted to coarse substrate.The vegetation is much more dense and stable than the alluvial fan in the arroyos behind Santa Fe Dam (San Gabriel Canyon SEA) and Hansen Dam (Tujunga Valley-Hansen Dam SEA).From its southern point, the SEA turns north to include the natural alluvial fan vegetation and border on the existing residential development on the alluvial fan.At the intersection of the San Antonio Wash with Mount Baldy Road, the SEA boundary follows the southeast side of Mount Baldy Road to the watershed of Chicken Canyon, which is a tributary of San Antonio Wash.The boundary crosses the road and includes the undeveloped part of Chicken Canyon. The boundary follows the minor ridgeline up to Potato Mountain, and goes along the south ridge of Evey Canyon back to cross Mount Baldy Road and return to the San Bernardino-Los Angeles County line in the San Antonio Debris Basin.Evey Canyon is outside the SEA, but is a preserve of the Claremont Colleges, and has excellent riparian canyon habitat. The SEA designation acknowledges the need to protext the Evey Canyon watershed. Small tributary watersheds of San Antonio Canyon with chaparral vegetation are included with the Chicken Canyon area.

Vegetation

The variety of topography, soil types, slope aspects and water availability within the San Dimas

Canyon-San Antonio Wash SEA creates a range of physical habitats, which support numerous plant species.Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.*Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Brief descriptions and general locations of each major plant community present within the SEA are provided below, including bigcone Douglas-fir-canyon oak forest, white alder riparian forest, alluvial fan scrub, oak woodland, oak riparian forest, walnut woodland, southern willow scrub, chaparral, coastal sage scrub, and non-native grassland.

Bigcone Douglas-Fir–Canyon Oak Forest:An open to dense forest dominated by bigcone Douglas-firthat is 50 to 80 feet tall over a dense canopy of canyon live oak.It is found scattered throughout the San Dimas Canyon component of this SEA on canyon sides at elevations generally above 2,500 feet, where it occupies rocky substrates. It commonly occurs in small enclaves within chaparral.

Corresponding MCV communities:

- *Pseudotsuga macrocarpa* (bigcone Douglas-fir forest)Forest Alliance
- *Quercus chrysolepis* (canyon live oak forest)Forest Alliance

White Alder Riparian Forest: Found along the lower reaches of San Dimas Canyon.This community is dominated by white alder, which grow 30 to 40 feet high over a shrub understory.It typically grows along streams in bedrock-constrained, steep-sided canyons, which results in a fairly narrow riparian corridor.

Corresponding MCV communities:

- *Alnus rhombifolia* (white alder groves) Forest Alliance

Alluvial Fan Scrub:A shrub community characterized by harsh substrates and subject to episodic flooding and scouring.It is generally restricted to broad canyon outwashes, or alluvial washes.It is found in this SEA at the San Antonio Canyon mouth, where it forms an open shrub vegetation within areas of bare, scoured ground in between.

Corresponding MCV communities:

- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Eriogonum fasciculatum-Salvia apiana* (California buckwheat-white sage scrub)Shrubland Alliance
- *Lepidospartum squamatum* (scale broom scrub) Shrubland Alliance
- *Malosma laurina* (laurel sumac scrub)Shrubland Alliance

Oak Woodland:A plant community dominated by species of the oak genus (*Quercus*).This

community includes coast live oak (*Quercus agrifolia* var. *agrifolia*), which typically grows to heights of 20 to 40 feet and the somewhat smaller coast live oak (*Quercus agrifolia* var. *agrifolia*) and canyon oak, and forms either closed or open tree canopies.Understory vegetation varies from grassland in level areas to shrubs, where topography is steeper.It may also intergrade with shrub communities.This community is scattered throughout the SEA and most prevalent on north-facing slopes and in drainage bottoms.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance
- *Quercus chrysolepis* (canyon live oak forest) Forest Alliance
- *Quercus engelmannii* (Engelmann oak woodland) Woodland Alliance

Oak Riparian Forest: A closely related community to oak woodland found in the SEA.This community is also dominated by coast live oak (*Quercus agrifolia* var. *agrifolia*) (canyon oaks at higher elevations).The primary difference between oak woodland and oak riparian forest is the greater availability of water in riparian situations, which is expressed in a denser tree canopy cover and higher density of trees.There are also a greater number of hydrophytic (moisture-favoring) plant species in the understory.Typical riparian trees, such as western sycamore (*Platanus racemosa*) and willow occasionally occur.Oak riparian forest is best developed within the broader, more level gradient drainages of this SEA.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance
- *Quercus chrysolepis* (canyon live oak forest) Forest Alliance
- *Quercus engelmannii* (Engelmann oak woodland) Woodland Alliance

Walnut Woodland:Often intergrades with oak dominated woodlands or develops as a distinct community.This community is dominated by the Southern California black walnut (*Juglans californica*), which grows 10 to 30 feet high.More often than not, walnut woodland in this SEA is highly intermixed with oak woodland and chaparral, and large monotypic stands are uncommon.

Corresponding MCV communities:

- *Juglans californica* (Southern California black walnut groves) Woodland Alliance

Southern Willow Scrub: Found along widely scattered reaches of several drainages throughout this SEA.This community is dominated by species of willow, which form nearly monotypic stands due to their dense growth, with an occasional cottonwood.These stands generally reach 10 to 20 feet in height with little understory vegetation.

Corresponding MCV communities:

- *Salix exigua* (sandbar willow thickets) Shrubland Alliance

- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance

Chaparral:A shrub community composed of robust species.Within this SEA, a number of chaparral subcommunities are found, which are differentiated by their dominant plant species.These include chamise (*Adenostoma fasciculatum*), buck brush (*Ceanothus* spp.), scrub oak (*Quercus berberidifolia*), coast live oak (*Quercus agrifolia* var. *agrifolia*), and mosaics of these depending on mixtures of species and elevation.These and other shrub species form dense vegetation covers, which grow 5 to 10 feet in height.The development of chaparral is pronounced over large hillside areas throughout both components of the SEA.

Corresponding MCV communities:

- *Adenostoma fasciculatum* (chamise chaparral) Shrubland Alliance
- *Adenostoma fasciculatum-Salvia apiana* (chamise-white sage chaparral) Shrubland Alliance
- *Arctostaphylos glandulosa* (Eastwood's manzanita chaparral) Shrubland Alliance
- *Arctostaphylos glauca* (bigberry manzanita chaparral) Shrubland Alliance
- *Ceanothus greggii* (cup leaf ceanothus chaparral) Shrubland Alliance
- *Ceanothus leucodermis* (chaparral whitethorn) Shrubland Alliance
- *Ceanothus oliganthus* (hairy leaf ceanothus chaparral) Shrubland Alliance
- *Prunus ilicifolia* (holly leaf cherry chaparral)Shrubland Alliance
- *Rhus ovata* (sugarbush chaparral)Shrubland Alliance

Coastal Sage Scrub: A shrubland community that exhibits less robust structure found within this SEA.This plant community is dominated by California sagebrush (*Artemisia tridentata*), California brittle bush (*Encelia californica*), white sage (*Salvia apiana*), black sage (*Salvia mellifera*), and California buckwheat (*Eriogonum fasciculatum*).It also forms dense stands, which grow three to four feet in height.Within this SEA, it is generally found in scattered patches, which are highly integrated with mixed chaparral.These are primarily located in the lower elevation hillsides of both SEA components.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance

- *Dendromecon rigida* (bush poppy scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub) Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Eriogonum fasciculatum-Salvia apiana* (California buckwheat-white sage scrub)Shrubland Alliance
- *Ericameria linearifolia* (narrowleaf goldenbush scrub) Provisional Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub) Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub) Shrubland Alliance

Non-Native Grassland:Dominated by non-native annual grasses and forbs.These opportunistically growing species include brome grasses, wild oats and mustards.This community became established as a result of livestock grazing and agriculture, as native vegetation is removed, sometimes by mechanical means, and replaced by more opportunistic species.Non-native grassland is found throughout the SEA.

Corresponding MCV communities:

- *Avena* (*barbata, fatua*) (wild oats grasslands) Semi-Natural Herbaceous Stands
- *Brassica* (*nigra*)and other mustards (upland mustards) Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus*, *hordeaceus*)-*Brachypodium distachyon* (annual brome grasslands)Semi-Natural Herbaceous Stands
- *Bromus rubens-Schismus* (*arabicus, barbatus*)([*Bromus madritensis*ssp.*rubens*] red brome or Mediterranean grass grasslands)Semi-Natural Herbaceous Stands
- *Centaurea* (*solstitialis, melitensis*)(yellow star-thistle fields)Semi-Natural Herbaceous Stands
- *Lolium perenne* [*Festuca perennis*](perennial rye grass fields)Semi-Natural Herbaceous Stands

Wildlife

Wildlife populations within the SEA are diverse and abundant due to the region's physiographic diversity, its relative isolation, and its location within and adjacent to the Angeles National Forest.Analysis of invertebrates on any given site is generally limited by a lack of specific data; however, the size of the SEA and diversity of habitats present is considered sufficient to encompass healthy populations of a large number of invertebrate species.Fair numbers of amphibians are expected to be present primarily due to the aquatic and semi-aquatic habitats provided within the

numerous drainages and several reservoirs.Reptile abundance and diversity are expected to be characteristic for the habitats present, although areas closer to urban development along the southern boundaries of this SEA are likely to be suppressed due to the edge effect.

Bird use, diversity, and abundance within the SEA are expected to be high for several reasons.In general, this SEA provides habitat for a wide range of shrubland, woodland, forest, and riparian species that occur at varying elevations.In particular, the riparian habitats found in drainages throughout this SEA provide essential habitat for riparian-obligate and riparian-favoring species.In addition, a number of migratory birds use this area to move across the northern portion of the Los Angeles Basin.These include a wide spectrum of birds including songbirds, waterfowl, and raptorial species.

Similarly, the mammalian fauna is expected to be very diverse and abundant.Virtually all mammalian species found in the forest (with the exception of Nelson's bighorn sheep (*Ovis canadensis nelsoni*)) are expected to be found in this SEA.Frequent observations of American black bear (*Ursus americanus*) and mountain lion (*Puma concolor*) in foothill communities attest to the range of species expected.

Wildlife Movement

Wildlife movement within the SEA takes on two major forms.First, due to the extreme intervening topography, it is logical to expect considerable movement of wildlife up and down the many sizeable drainages, which course through this SEA and connect the forest interior with foothill areas.The larger the watershed of the drainages, the greater the volume of movement.Consequently, this type of movement occurs on a seasonal and more frequent basis, particularly for large mobile mammals, such as American black bear, mountain lion, coyote (*Canis latrans*), bobcat (*Lynx rufus*) and mule deer (*Odocoileus hemionus*), whose full range of habitat needs are typically met over broad areas.

The second major type of movement occurs across the flanks of the foothills and lower mountains, in an east-west direction.Particularly for riparian-favoring migratory birds, a corridor linking lower elevational riparian habitats in the SEA is expected to be of high use and importance.In addition to providing essential habitat for resident riparian birds, this SEA contains some of the best developed riparian habitat for birds, which are seasonal visitors to the cismontane region of the County.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition.

Sensitive Plan Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the

California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.The communities include walnut woodland, southern coast live oak riparian forest, southern willow scrub, coastal sage chaparral scrub, and Riversidean alluvial fan sage scrub, which occur throughout the SEA.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*)RPR 2.2
- Coulter's saltbush (*Atriplex coulteri*)RPR 1B.2
- Davidson's saltscale (*Atriplex serenana* var. *davidsonii*)RPR 1B.2
- Nevin’s barberry (*Berberis nevinii*)FE, SE, RPR 1B.1
- Round-leaved filaree (*California macrophylla*)RPR 1B.1
- Smooth tarplant (*Centromadia pungens* ssp. *laevis*)RPR 1B.1
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*)RPR 1B.1
- White-bracted spineflower (*Chorizanthe xanti* var. *leucotheca*)RPR 1B.2
- Slender-horned spineflower (*Dodecahema leptoceras*)FE, SE, RPR 1B.1
- San Gabriel Mountains dudleya (*Dudleya densiflora*)RPR 1B.1
- Many-stemmed dudleya (*Dudleya multicaulis*)RPR 1B.2
- Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*)RPR 1A
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)RPR 1B.1
- Jokerst’s monardella (*Monardella australis* ssp. *jokerstii*)RPR 1B.1

- Rock monardella *(Monardella viridis* ssp*. saxicola)*RPR 4.2
- Prostrate vernal pool navarretia (*Navarretia prostrata*)RPR 1B.1
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*)RPR 2.2
- Chaparral ragwort (*Senecio aphanactis*)RPR 2.2
- Salt spring checkerbloom (*Sidalcea neomexicana*)RPR 2.2
- San Bernardino aster (*Symphyotrichum defoliatum*)RPR 1B.2
- Rigid fringepod (*Thysanocarpus rigidus*)RPR 1B.2
- Thread-leaved brodiaea (*Brodiaea filifolia*)RPR FT, SE, 1B.1
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)RPR 1B.2
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2
- California sawgrass (*Cladium californicum*)RPR 2.2
- California muhly (*Muhlenbergia californica*)RPR 4.3

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- California diplectronan caddisfly (*Diplectrona californica*)~~CDFG~~CDFW Special Animals List
- Santa Ana sucker (*Catostomus santaanae*)FT, FSS, SSC
- San Gabriel Mountains slender salamander (*Batrachoseps gabrieli*)FSS
- Large-blotched salamander (*Ensatina klauberi*)FSS, SSC
- Northern leopard frog (*Lithobates pipiens*)FSS, SSC
- Sierra Madre yellow-legged frog (*Rana muscosa*)FE, FSS, SSC
- Coast range newt (*Taricha torosa*)SSC
- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- San Diego banded gecko (*Coleonyx variegatus abbotti*)~~CDFG~~CDFW Special Animals List
- Western pond turtle (*Emys marmorata*)BLMS, FSS, SSC

- San Bernardino mountain kingsnake (*Lampropeltis zonata parvirubra*)FSS, SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Coast patch-nosed snake (*Salvadora hexalepis virgultea*)SSC
- Two-striped garter snake (*Thamnophis hammondii*)BLMS, FSS, SSC
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Grasshopper sparrow (*Ammodramus savannarum*)~~CDFG~~CDFW Special Animals List
- Bell's sage sparrow (*Amphispiza belli belli*)BCC, ~~CDFG~~CDFW Watch List
- Burrowing owl (*Athene cunicularia*)BCC, BLMS, SSC
- Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*)BCC, FSS, SSC
- Yellow warbler (*Dendroica petechia brewsteri*)SSC
- White-tailed kite (*Elanus leucurus*)~~CDFG~~CDFW Fully Protected
- Southwestern willow flycatcher (*Empidonax traillii extimus*)FE, FSS, SE, USBC, AWL, ABC
- Merlin (*Falco columbarius*)~~CDFG~~CDFW Watch List
- Yellow-breasted chat (*Icteria virens*)SSC
- Coastal California gnatcatcher (*Polioptila californica californica*)FT, SSC, USBC, AWL, ABC
- Least Bell's vireo (*Vireo bellii pusillus*)FE, BCC, SE, USBC, AWL, ABC
- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)SSC
- San Bernardino kangaroo rat (*Dipodomys merriami parvus*)FE, SSC
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Hoary bat (*Lasiurus cinereus*)WBWG Medium
- Western yellow bat (*Lasiurus xanthinus*)WBWG High
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)SSC
- Yuma myotis (*Myotis yumaensis*)BLMS, WBWG Low-Medium

- San Diego desert woodrat (*Neotoma lepida intermedia*)SSC
- Pocketed free-tailed bat (*Nyctinomops femorosaccus*)SSC, WBWG Medium
- Big free-tailed bat (*Nyctinomops macrotis*)SSC, WBWG Medium-High
- Los Angeles pocket mouse (*Perognathus longimembris brevinasus*) FSS, SSC
- American badger (*Taxidea taxus*)SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met described below.

Criteria Analysis of the San Dimas Canyon and San Antonio Wash SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	NotMet	Although the SEA contains rare plant populations, it does not contain a core population of a listed species and therefore does not meet this criterion.The lower slopes in and around San Dimas Canyon support one of the largest populations of the coastal cactus wren in the County, which is a subspecies that is very threatened throughout its range, although not officially recognized by listing.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The SEA contains habitat of the rare rock monardella.In addition, several plant communities within this SEA are ~~CDFG~~CDFW highest priority communities due to their restricted distribution in the Southern California region, including:walnut woodland, oak riparian woodland, southern willow scrub, coastal sage scrub, and alluvial fan scrub.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Met	All of the plant communities and habitats mentioned as being restricted in distribution on a regional basis, are also restricted in distribution within the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The major canyons within this SEA support well-developed and diverse riparian woodlands, as well as a source of perennial water.These represent important stopover and overwintering areas for a wide variety of migratory birds, as well as essential habitat for resident species of fauna and flora.These canyons also support seasonal and more frequent movement for wide-ranging mammals, which must move over large areas to fulfill their habitat requirements.The federally-threatened California gnatcatcher has been sighted (2010) in the Glendora foothills, and probably maintains a small population along

			the lowest slopes of the San Gabriel Mountains.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	NotMet	The SEA does not contain biotic resources that are clearly an extreme in physical/geographical limitations, or represent unusual variation in a population or community, and therefore does not meet this criterion.However, the extreme localization of several species of plants in the SEA may indicate geographical processes that are not well understood at this time that merit scientific inquiry.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Virtually all of the native biotic communities within this SEA are relatively undisturbed over most of their extent. Because urbanization throughout much of the County's foothill regions has removed large expanses of these communities, those in the SEA are particularly important to the County's natural heritage.

In conclusion, the area is an SEA because it contains:B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; and F) areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.

San Gabriel Canyon SEA

Location

General

The San Gabriel Canyon Significant Ecological Area (SEA) is located along the cismontane foothills of the eastern section of these mountains.Generally, the SEA is centered on the mouths of three major canyons, which flow from the mountains and interconnecting terrain.From west to east these include, Santa Anita, Monrovia and Sawpit, and San Gabriel canyons, which are located above the cities of Sierra Madre, Arcadia, Monrovia, Duarte, Bradbury, Irwindale, and Azusa.A substantial part of the eastern and southern part of the SEA along the San Gabriel River is in the California Audubon-designated State Important Bird Area (IBA) of the Los Angeles Flood Control Basin IBA.The San Gabriel River has largely been dammed and channelized, but with infrequent clearing of the detention basins and wash areas, substantial parts of the San Gabriel River have reverted to riparian habitat or the even more rare alluvial fan habitat, and this attracts many resident birds, as well as numerous spring and winter migrants.

The SEA is found within the, Mount Wilson, Azusa, San Dimas, and Glendora U.S. Geological Survey (USGS) 7.5' California Quadrangles.

General Boundary and Resources Description

Over most of its boundaries (north, east, and west), the SEA is bordered by open space within the Angeles National Forest.However, generally to the south, the borders are defined by the edge of urban development within the San Gabriel Valley.The SEA begins in the west at the peak of Mount

Wilson within the Angeles National Forest.Traveling east, the northerly boundary follows a major east-west trending ridgeline to Pine Mountain.This ridgeline defines the separation between the watershed of the San Gabriel River West Fork to the north, and the Santa Anita, Sawpit, and lower San Gabriel canyons to the south.These front-range canyons are tributaries of the San Gabriel River.

At Pine Mountain, the boundary turns south to follow the ridgeline that is the western border of the San Gabriel River, and turns east onto a secondary ridge, and descends towards the San Gabriel River near the Morris Reservoir Dam.This easterly boundary crosses the San Gabriel Canyon at Morris Dam and climbs the adjacent ridgeline to Glendora Ridge and the Glendora Ridge Motorway. The southerly boundary follows the motorway to the west, to the point near the mouth of the San Gabriel Canyon where the motorway leaves the ridgeline.The SEA boundary turns north towards the San Gabriel River, and descends to the opening of the San Gabriel Canyon into the Los Angeles Basin.This is between the Glendora Ridge and the mountains near Fish Canyon.The boundary turns along the southeast side of the San Gabriel River floodplain and follows the east side of the San Gabriel River flood control channel.A development near the mouth of Roberts Canyon that is just north of the river mouth has been excluded from the SEA.

In the mouth of the San Gabriel Canyon is a population of the San Gabriel Mountains live-forever (*Dudleya densiflora*), which is unusual in that it has multiple dense flower clusters, whereas other live-forevers have one or several flower stalks with spaced blooms.This live-forever is extremely limited in rangeand occurs only on the slopes of granitic rubble and canyon walls in the nearby south face of the San Gabriel Mountains.Another population is on private land about one mile upstream of the canyon mouth, on the north-side slope of the Glendora Ridge.Another live-forever population is upstream in nearby Fish Canyon, which is a little downstream of the Fish Canyon Falls.Collections have been made from Mystic Canyon to the east,and Van Tassel Canyon to the west.

The mouth of San Gabriel Canyon and nearby canyons are the principle area for the San Gabriel bedstraw (*Galium grande*), which is another local endemic. The only known populations of the bedstraw and the San Gabriel Mountains live-forever on the planet occur in the County in this small area of the San Gabriel Mountains.

The Los Angeles Flood Control BasinIBA covers all of the SEA in the San Gabriel River and downstream at the Santa Fe Dam Recreation Area.Furthermore, the IBA extends upstream beyond the SEA to the confluence area of the West, North, and East forks of the San Gabriel River in the Angeles National Forest, and it extends downstream beyond Santa Fe Dam to the Whittier Narrows Dam.

A finger of the SEA extends along the San Gabriel River, south of its confluence area with Fish and Van Tassel canyons to pass under the Interstate-210.The finger boundary enlarges around the Santa FeFlood Control Basin and Recreation Area to include one of the last remaining natural alluvial fan habitats in the County.The Santa Fe Flood Control Basin is one of the most unusual vegetation habitats in the County, and has special sensitive species, as described below in the Vegetation section.

The main SEA boundary continues just west of the Van Tassel Canyon confluence along the north side of the Encanto Equestrian Center, along the northern extent of development in the City of Duarte. A lobe of the SEA encloses the natural habitat of the steep watershed areas of Spinks and Maddox canyons, extending to the edge of development in the City of Bradbury. The ridge bordering

the southeast side of Bliss Canyon is the western edge of the lobe, and the boundary crosses Bliss Canyon at its upper end near the Van Tassel Truck Trail.At this point the boundary of the SEA has reentered the Angeles National Forest.After crossing Bliss Canyon, the boundary follows the southern ridgeline of Spanish Canyon westward to cross out of the Angeles National Forest,tracking around the northern arm of the City of Monrovia.The Sawpit Debris Basin is included in the SEA as is the undeveloped part of Monrovia Canyon Park. To the west of Monrovia Canyon, a lobe of the SEA extends along the undeveloped ridges of the San Gabriel Mountains bordered by the urban edges of the City of Monrovia and City of Arcadia.These communities extend into the mountains where the cities have municipal water rights.The southern boundary skirts the edge of development in Santa Anita Canyon, but includes the Santa Anita Debris Basin, Arcadia Natural Park, Big Santa Anita Dam and Reservoir, and the Santa Anita Canyon stream course above the Dam, which has numerous lease-hold cabins north of the 1600 feet elevation contour.The boundary reenters the Angeles National Forest just north of Arcadia Natural Park.

The southern ridge of Sawpit Canyon, from its dam to about a 0.5 mile upstream has a population of the endangered San Gabriel bedstraw (*Galium grande)*, which is an endemic species of highly restricted distribution.It occurs only on the south slopes of the western section of the San Gabriel Mountains.

Within the SEA, just to the south of Arcadia Natural Park is a Santa Anita Canyon tributary, Clamshell Canyon.On the south banks and ridge of Clamshell Canyon is critical habitat for the federally-endangered Braunton's milk-vetch (*Astragalus brauntonii*), which is a locoweed that prefers interbedded sandstone and carbonate substrate, probably deposited near the coastline of former oceans.Very limited areas of this substrate occur at the boundary of the San Gabriel Mountains in this area.Most of the rocks of the San Gabriel Mountains are igneous granites and metamorphic rocks.

Santa Anita Canyon has some stands of Pacific madrone (*Arbutus menziesii*), which is a plant known elsewhere from the Pacific coast north of Santa Barbara to British Columbia.The Santa Anita stands are isolated occurrences, which is one of the few places madrone is found between Santa Barbara and Baja California.

Near the confluence with Winter Creek in the vicinity of Chantry Flats, the southern boundary of the SEA turns west and climbs the southern ridgeline of Winter Creek, including Winter Creek watershed in the SEA and excluding San Olene Canyon on the south.The boundary follows the ridgeline, marking the southern limits of the Winter Creek watershed to Mount Harvard, and then travels along the Harvard ridgeline to Mount Wilson.

The SEA is comprised of three major canyons: San Gabriel, Sawpit, and Santa Anita.In general, the topography of the SEA is severe, consisting of steep-walled canyons and narrow ridgelines.Elevations range from a high of approximately 5,710 feet above mean sea level (MSL) at Mount Wilson, to a low of approximately 660 feet above MSL in San Gabriel Canyon.Numerous drainages and tributaries of the main canyons are included in the SEA and exit the San Gabriel Mountains into the Los Angeles Basin through this SEA.

The wide range of elevation, topography, slope aspect, and geology represent a wide array of physical habitats within this SEA.Consequently, a number of plant communities exist, including grasslands, riparian, shrublands, woodlands, and forests.Within these major community types, there are many sub-communities, which vary according to plant species dominance.Of particular note, this

SEA contains the last remaining relatively well-developed lower montane riparian habitats in the eastern County and dammed drainages that have created significant reservoirs or flood control basins in Sawpit and Santa Anita canyons.Enclaves of sensitive plant species and vegetation habitats are found here.Other jurisdictions within the SEA include the unincorporatedarea of the County, the City of Arcadia, City of Monrovia, City of Bradbury, City of Irwindale, City of Duarte,City of Azusa, and the City of Glendora.

Vegetation

There are numerous special vegetation habitats in this SEA.By virtue of elevation, rugged topography of ridges and canyons, variation in aspect due to faulting, and contiguous high elevation areas in the San Gabriel Mountains, this SEA has numerous habitats that are not represented in many or sometimes any of the other SEAs.The coniferous forests, oak tree forests, canyon floras, and various kinds of chaparral contribute to a multitude of habitat types.Some of the very special areas mentioned briefly here are the Santa Fe Dam Recreation Area, which is on an alluvial fan, the canyons that debouche onto the alluvial fans of the Los Angeles Basin, and populations of rare and uncommon species that occur throughout the SEA area.

The floodplain of the San Gabriel River behind Santa Fe Dam supports one of the last examples of alluvial fan, which was once found all along the San Gabriel Mountains where the numerous canyon outwash areas cross the thrust faults that create the mountains, and deposit their sediment loads onto the floor of the Los Angeles Basin.The alluvial fan vegetation supports a community of organisms that is disappearing from the County.It has plant species that are now unusual on the coastal side of the San Gabriel Mountains and uncommon in the Los Angeles Basin, such as California juniper (*Juniperus californica*), white alder (*Alnus rhombifolia*), and the stands of native cactus *Opuntia littoralis*(prickly pear) and *O. parryi* (cholla). It also has many native plants from the alluvial fan community that are still common along the mountain front. This habitat has been largely displaced by urbanization and flood control projects.The bajada, or connected fans, once enabled wildlife movement all along the face of the San Gabriel Mountains and connected the canyon communities with one another.The soft-bottomed channel of the San Gabriel River connects the Santa Fe Recreation area with the San Gabriel Mountains, and the willow- and mulefat-dominated riparian scrub provides the natural base for the community along the river and around the Santa Fe Dam Reservoir.The avian fauna here is very sensitive and directly related to the vegetation that occurs.One of the County's biggest populations of the state and federally-endangered least Bell's vireo (*Vireo bellii pusillus*) occurs and nests at the Santa Fe Dam Recreation area, as well as in other debris basins that have naturally-regenerated growth of willows and other riparian shrubs, where basins that are not scoured by too often.A species of special concern, the yellow-breasted chats (*Icteria virens*) prefer the elderberry and mulefat thickets.Fully-protected white-tailed kites (*Elanus leucurus*) hunt over the low-profile, expansive fan vegetation.The very sensitive coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), extirpated in most of the County, can breed in the cholla and prickly-pear cactus thickets of the alluvial fan area.Uncommon riparian species, such as rock wren (*Salpinctes obsoletus*),yellow warbler (*Dendroica petechia brewsteri*), and willow goldfinch (*Spinus tristis salicamans*) are frequently encountered in the riparian areas of the Santa Fe Dam Recreation Area.

Special sensitive plants that are extremely localized are found in this SEA.These include the San Gabriel bedstraw and the San Gabriel live-forever.The critical habitat of the endangered Braunton's milk-vetch along Clamshell Canyon is noted. The Pacific madrone in Santa Anita Canyon is an

example of what is probably a lone occurrence in the County.There may be other plants like the madrone in botanically-unexplored areas of the rugged front-range of the San Gabriel Mountains in this SEA.

The variety of topography, soil types, slope aspects and water availability within the SEA creates a range of physical habitats, which support numerous plant species.Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.*Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Brief descriptions and general locations of each major plant community present within the SEA are provided below, including bigcone Douglas fir-canyon oak forest, white alder riparian forest, alluvial fan scrub, oak woodland, oak riparian forest, walnut woodland, southern willow scrub, chaparral, coastal sage scrub, and non-native grassland.

Bigcone Douglas Fir–Canyon Oak Forest:An open to dense forest dominated by bigcone Douglas fir(*Pseudotsuga macrocarpa*) 50 to 80 feet tall over a dense canopy of canyon live oak (*Quercus chrysolepis*).It is found scattered throughout the SEA on canyon sides at elevations generally above 2,500 feet where it occupies rocky substrates.It commonly occurs in fairly small enclaves within chaparral.

Corresponding MCV communities:

- *Pseudotsuga macrocarpa* (bigcone Douglas-fir forest)Forest Alliance
- *Quercus chrysolepis* (canyon live oak forest)Forest Alliance

White Alder Riparian Forest: Along the upper reaches of many drainages in the SEA, white alder riparian forest is found.This community is dominated by white alder (*Alnus rhombifolia*), which grow 30 to 40 feet high over a shrub understory.It typically grows along streams in bedrock-constrained, steep-sided canyons, resulting in a fairly narrow riparian corridor.

Corresponding MCV communities:

- *Alnus rhombifolia* (white alder groves) Forest Alliance

Alluvial Fan Scrub:A shrub community characterized by harsh substrates subject to episodic flooding and scouring.It is generally restricted to broad canyon outwashes, or alluvial washes.It is found in this SEA at the San Gabriel Canyon mouth where it forms an open, shrub-dominated vegetation within areas of bare, scoured ground in between.

Corresponding MCV communities:

- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Eriogonum fasciculatum-Salvia apiana* (California buckwheat-white sage scrub)Shrubland Alliance

- *Lepidospartum squamatum* (scale broom scrub) Shrubland Alliance

- *Malosma laurina* (laurel sumac scrub)Shrubland Alliance

Oak Woodland:A plant community dominated by species of the oak genus (*Quercus*).Within this SEA, this community includes coast live oak (*Q. agrifolia* var. *agrifolia*), which typically grows to heights of 20 to 40 feet and the somewhat smaller interior live oak (*Q. wislizenii*) and canyon oak, and forms either closed or open tree canopies.Understory vegetation varies from grassland in level areas to shrubs where topography is steeper.It may also intergrade with shrub communities.Within this SEA oak woodland is scattered throughout and most prevalent on north-facing slopes and in drainage bottoms.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance

- *Quercus engelmannii* (Engelmann oak woodland) Woodland Alliance

Oak Riparian Forest: A highly related community to oak woodlands found in the SEA.This community is also dominated by coast live oak (or canyon oak at higher elevations).The primary difference between oak woodland and oak riparian forest is the greater availability of water in riparian situations, which is expressed in a denser tree canopy and higher density of trees.There are also a greater number of hydrophytic (moister favoring) plant species in the understory.Typical riparian trees, such as western sycamore (*Platanus racemosa*) and willow (*Salix spp.*) occasionally occur.Oak riparian forest is best developed within broader, more level gradient drainages of this SEA.

Corresponding MCV communities:

- *Quercus chrysolepis* (canyon live oak forest) Forest Alliance

Walnut Woodland:Often intergrades with oak dominated woodlands or develops as a distinct community. This community is dominated by Southern California black walnut (*Juglans californica*), which grows 10 to 30 feet high.More often than not, walnut woodland in this SEA is highly intermixed with oak woodland and chaparral, and large monotypic stands are uncommon.

Corresponding MCV communities:

- *Juglans californica* (Southern California black walnut groves) Woodland Alliance

Southern Willow Scrubs:Found along widely scattered reaches of several drainages throughout this SEA.This community is dominated by species of willow, which form nearly monotypic stands due to their dense growth with an occasional cottonwood.These stands generally reach 10 to 20 feet in height with little understory vegetation.

Corresponding MCV communities:

- *Salix exigua* (sandbar willow thickets) Shrubland Alliance

- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance

Chaparral:A shrub community composed of robust species.Within this SEA, a number of chaparral subcommunities are found, which are differentiated by their dominant plant species.These include chamise, buck brush (*Ceanothus* spp.), scrub oak (*Quercus durata* var. *gabrielensis*), interior shrub live oak (*Quercus wislizeni* var. *frutescens*), and mosaics of these depending on mixtures of species and elevation.These and other shrub species form dense vegetation covers growing 5 to 10 feet in height.The development of chaparral is pronounced over large hillside areas throughout the SEA.

Corresponding MCV communities:

- *Adenostoma fasciculatum* (chamise chaparral) Shrubland Alliance
- *Adenostoma fasciculatum-Salvia apiana* (chamise-white sage chaparral) Shrubland Alliance
- *Arctostaphylos glandulosa* (chamise chaparral) Shrubland Alliance
- *Arctostaphylos glauca* (bigberry manzanita chaparral) Shrubland Alliance
- *Ceanothus greggii* [*Ceanothus vestitus*](cup leaf chaparral) Shrubland Alliance
- *Ceanothus leucodermis* (chaparral whitethorn) Shrubland Alliance
- *Ceanothus spinosus* (greenbark ceanothus chaparral) Shrubland Alliance
- *Ceanothus oliganthus* (hairy leaf ceanothus chaparral) Shrubland Alliance
- *Prunus ilicifolia* (holly leaf cherry chaparral)Shrubland Alliance
- *Rhus ovata* (sugarbush chaparral)Shrubland Alliance

Coastal Sage Scrub: A shrubland community exhibiting less robust structure found in this SEA.This plant community is dominated by California sagebrush (*Artemisia tridentata*), California brittle bush (*Encelia californica*), white sage (*Salvia apiana*), black sage (*S. mellifera*), and California buckwheat (*Eriogonum fasciculatum*).It also forms dense stands, which grow three to four feet in height.Within this SEA, it is generally found in scattered patches, which are highly integrated with mixed chaparral.These are primarily located in the lower elevation hillsides of the SEA.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance

- *Dendromecon rigida* (bush poppy scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub) Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum cinereum* (ashy buckwheat scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Eriogonum fasciculatum-Salvia apiana* (California buckwheat-white sage scrub)Shrubland Alliance
- *Eriogonum wrightii* (Wright's buckwheat patches) Shrubland Alliance
- *Ericameria linearifolia* (narrowleaf goldenbush scrub) Provisional Shrubland Alliance
- *Hazardia squarrosa* (sawtooth golden bush scrub) Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub) Shrubland Alliance
- *Lupinus albifrons* (silver bush lupine scrub) Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub) Shrubland Alliance

Non-Native Grassland:Dominated by non-native annual grasses and forbs.These opportunistically growing species include brome grasses, wild oats and mustards.Characteristic of other parts of Southern California, this community became established as a result of livestock grazing and agriculture, as native vegetation is removed, sometimes by mechanical means, and replaced by more opportunistic species.Non-native grassland is found throughout the SEA.

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*) (wild oats grasslands) Semi-Natural Herbaceous Stands

Wildlife

Wildlife populations within the SEA are diverse and abundant due to the region's physiographic diversity, its relative isolation, and its location within and adjacent to the Angeles National Forest.The analysis of invertebrates is severely limited due to the lack of specific data, however, the SEA is likely to support healthy populations of a diverse assortment of invertebrate species based on the its undisturbed nature and variety of habitats.Fair numbers of amphibians are expected to be present primarily due to the aquatic and semi-aquatic habitats provided within the numerous drainages and several reservoirs.Reptile abundance and diversity are expected to be characteristic for the habitats present, although areas closer to urban development along the southern boundaries of this SEA are likely to be suppressed due to edge effect.

Bird use, diversity, and abundance within the SEA are expected to be high for several reasons.In general, this SEA provides habitat for a wide range of shrubland, woodland, forest, and riparian species that occur at varying elevations.In particular, the riparian habitats found in drainages throughout this SEA provide essential habitat for riparian-obligate and riparian-favoring species.In addition, a number of migratory birds use this area to move across the northern portion of the Los Angeles Basin.These include a wide spectrum of birds including songbird, waterfowl, and raptorial species.

Similarly, the mammalian fauna is expected to be very diverse and abundant.The vast open space of the Angeles National Forest and its diversity of habitats exerts much influence on the great variety of taxa in this SEA.Virtually all mammalian species found in the forest (with the exception of Nelson's bighorn sheep (*Ovis canadensis nelsoni*)) are expected to be found in this SEA.Frequent observations of American black bear (*Ursus americanus*) and mountain lion (*Puma concolor*) in foothill communities attest to the range of species expected.

Wildlife Movement

Wildlife movement within the SEA takes on two major forms.First, due to the extreme intervening topography, it is logical to expect considerable movement of wildlife up and down the sizeable drainages, which course through this SEA to connect the forest interior with foothill areas.Consequently, this type of movement occurs on a seasonal and more frequent basis, particularly for large mobile mammals whose full range of habitat needs are typically met over broad areas, including American black bear, mountain lion, coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), gray fox (*Urocyon cinereoargenteus*) and other medium-sized mammals.

The second major type of movement occurs across the flanks of the foothills and lower mountains, in an east-west direction. Particularly for riparian-favoring migratory birds, a corridor linking lower elevation riparian habitats in the SEA is of high use and importance. In addition to providing essential habitat for resident riparian birds, this SEA contains some of the best developed riparian habitat for birds, which are seasonal visitors to the cismontane region of the County.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas."Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species.The Braunton's milk-vetch has critical habitat in this SEA.

Sensitive Plan Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are

inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.These communities include bigcone Douglas-fir forest, California buckwheat-white sage scrub, scale broom scrub, Engelmann oak woodland, Southern California black walnut groves, chamise-white sage chaparral, cup leaf ceanothus chaparral, hairy leaf ceanothus chaparral, holly leaf cherry chaparral, California brittle bush scrub, white sage scrub, ashy buckwheat scrub, Wright's buckwheat patches, narrowleaf goldenbush scrub, and sawtooth golden bush scrub.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Slender silver moss (*Anomobryum julaceum*)RPR 2.2
- Scalloped moonwort(*Botrychium crenulatum*)RPR 2.2
- Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*)RPR 2.2
- San Gabriel manzanita (*Arctostaphylos glandulosa* ssp. *gabrielensis*)RPR 1B.2
- Braunton's milk-vetch (*Astragalus brauntonii*)FE, RPR 1B.1
- Nevin's barberry (*Berberis nevinii*)FE, SE, RPR 1B.1
- Round-leaved filaree(*California macrophylla*)RPR 1B.1
- Southern tarplant(*Centromadia parryi* ssp. *australis*)RPR 1B.1
- Parry's spineflower(*Chorizanthe parryi* var. *parryi*)RPR 1B.1
- Peruvian dodder (*Cuscuta obtusiflora* var. *glandulosa*)RPR 2.2
- Slender-horned spineflower (*Dodecahema leptoceras*)FE, SE, RPR 1B.1
- San Gabriel River dudleya (*Dudleya cymosa* ssp. *crebrifolia*)RPR 1B.2

- San Gabriel Mountains dudleya (*Dudleya densiflora*)RPR 1B.1
- Many-stemmed dudleya (*Dudleya multicaulis*)RPR 1B.2
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)RPR 1B.1
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)RPR 1B.1
- Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)RPR 1B.2
- White rabbit-tobacco(*Pseudognaphalium leucocephalum*)RPR 2.2
- Parish's gooseberry (*Ribes divaricatum* var. *parishii*)RPR 1A
- Chaparral ragwort (*Senecio aphanactis*)RPR 2.2
- San Bernardino aster (*Symphyotrichum defoliatum*)RPR 1B.2
- Greata's aster (*Symphyotrichum greatae*)RPR 1B.3
- Thread-leaved brodiaea (*Brodiaea filifolia*)FT, SE, RPR 1B.1
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)RPR 1B.2
- Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*)RPR 1B.2
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2
- Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*)RPR 1B.2
- Western sedge (*Carex occidentalis*)RPR 2.3
- California sawgrass (*Cladium californicum*)RPR 2.2
- Vernal barley (*Hordeum intercedens*)RPR 3.2
- California satintail (*Imperata brevifolia*)RPR 2.1

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Santa Ana sucker (*Catostomus santaanae*)FT, SSC
- Arroyo chub (*Gila orcuttii*)SSC
- Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3)SSC
- Arroyo toad (*Anaxyrus californicus*)FE, SSC

- San Gabriel Mountains slender salamander (*Batrachoseps gabrieli*)FSS
- Large-blotched salamander (*Ensatina klauberi*)FSS, SSC
- Sierra Madre yellow-legged frog (*Rana muscosa*)FE, FSS, SSC
- Coast range newt (*Taricha torosa*)SSC
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- Rosy boa (*Charina trivirgata*)BLMS, FSS
- Western pond turtle (*Emys marmorata*)BLMS, FSS, SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Two-striped garter snake (*Thamnophis hammondii*)BLMS, FSS, SSC
- Cooper's hawk (*Accipiter cooperii*)~~CDFG~~CDFW Watch List
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*)SSC, FSS, BCC
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)FC, BCC, FSS, SE
- Black swift (*Cypseloides niger*)BCC, SSC, USBC, AWL, ABC
- Yellow warbler (*Dendroica petechia brewsteri*)SSC, BCC
- Southwestern willow flycatcher (*Empidonax traillii extimus*)FE, FSS, SE, USBC, AWL, ABC
- Merlin (*Falco columbarius*)~~CDFG~~CDFW Watch List
- Yellow-breasted chat (*Icteria virens*)SSC
- Coastal California gnatcatcher (*Polioptila californica californica*)FT, SSC, USBC, AWL, ABC
- Bank swallow (*Riparia riparia*)ST
- Least Bell's vireo (*Vireo bellii pusillus*)FE, BCC, SE, USBC, AWL, ABC
- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Hoary bat (*Lasiurus cinereus*) WBWG Medium

- Western yellow bat (*Lasiurus xanthinus*)WBWG High
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)SSC
- Fringed myotis (*Myotis thysanodes*)BLMS, WBWG High
- Long-legged myotis (*Myotis volans*)BLMS, SSC, WBWG Medium
- Yuma myotis (*Myotis yumaensis*)BLMS, WBWG Low-Medium
- Pocketed free-tailed bat (*Nyctinomops femorosaccus*)SSC, WBWG Medium
- Big free-tailed bat (*Nyctinomops macrotis*)SSC, WBWG Medium-High
- American badger (*Taxidea taxus*)SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE SAN GABRIEL CANYON SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	The SEA contains a core habitat area for the endangered plant Braunton's milkvetch. The upper San Gabriel River is a core habitat of several native fishes, one of the last areas where three of five original natives occur together: federally-threatened Santa Ana sucker, and the arroyo chub and Santa Ana speckled dace,which is of state concern. All three live in the San Gabriel River in the SEA area. A local population of the speckled dace is known from the mouth of Fish Canyon. The very rare San Gabriel bedstraw and San Gabriel Mountains live-forever only occur in this area of the world.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The SEA contains habitat of extremely rare plants: San Gabriel bedstraw and the San Gabriel Mountains dudleya. In addition, several plant communities within this SEA are ~~CDFG~~CDFW highest priority communities due to their restricted distribution in the Southern California region. These communities include walnut woodland, oak riparian woodland, southern willow scrub, coastal sage scrub, and alluvial fan scrub. The federally-endangered California gnatcatcher has been recently sighted in the Glendora foothills, and probably maintains a small population along the lowest slopes of the San Gabriel Mountains.
	Within the County, biotic communities, vegetative		All of the plant communities and habitats mentioned as being restricted in distribution on a regional basis, are also restricted in

Criterion		Status	Justification
C)	associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	distribution within the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The three major canyons within this SEA support well-developed and diverse riparian woodlands, as well as year-round water sources. These represent important stopover and overwintering areas for a wide variety of migratory birds, as well as essential habitat for resident species. These canyons also support seasonal and more frequent movement for wide-ranging mammals, which must move over large areas to fulfill their habitat requirements.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The SEA contains biotic resources that are of scientific interest for their very restricted distributions: the San Gabriel bedstraw, the San Gabriel Mountains live-forever, and a local isolated population of the Pacific madrone. The population of Santa Ana speckled dace in Fish Canyon may be the remaining extreme western extent of its population.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Virtually all of the native biotic communities within this SEA are relatively undisturbed over most of their extent. Because urbanization throughout much of the County's foothill regions has removed large expanses of these communities, those in the SEA are particularly important to the County's natural heritage.

In conclusion, the area is an SEA because it contains: A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, and migrating grounds, which are limited in availability in the County; E) populations of scientific interest because of very restricted distributions and isolated populations; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Santa Clara River SEA

Location

General

The Santa Clara River Significant Ecological Area (SEA) extends along the entire County reach of the Santa Clara River, primarily within unincorporated areas of the County.The SEA encompasses a wide variety of topographic features and habitat types, as well as major tributaries—all of which contribute to this diversity. It is a major biotic corridor for the County (and Ventura County). The orientation and extent of the SEA depends upon the surface and subsurface hydrology of the Santa Clara River, from its headwaters, tributaries, and watershed basin, to the point at which it exits the

County's jurisdiction. Nearly all of the SEA is designated by California Audubon as a Globally Important Bird Area (IBA). The Santa Clara River IBA extends beyond the SEA in both upstream and downstream directions (across Soledad Pass to the Barrel Springs area in the Antelope Valley and through Ventura County to the mouth of the River at the Pacific Ocean).

The SEA is located at least partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles:Pacifico Mountain, Acton, Agua Dulce, Sunland, San Fernando, Mint Canyon, Oat Mountain, Newhall, and Val Verde.

General Boundary and Resources Description

The SEA covers a wide variety of topographic features and habitat types, including parts of the watershed tributaries. The biological and ecological functionality of the SEA is integrally linked to the Santa Clara River basin for its entire length. The bio-geographic limits of the SEA would extend downstream through Ventura-Los Angeles County line to its mouth at the Pacific Ocean, and encompass significant tributary drainages of Ventura County (Piru Creek, Sespe Creek, Santa Paula Creek, Wheeler Creek, etc.).

The eastern portion of the SEA follows natural contours at the headwaters of the watershed to incorporate much of upper watershed of Soledad Canyon (which becomes the Santa Clara River), the Kentucky Springs and the Aliso Canyon basins, and the downstream unnamed tributaries of the Santa Clara River to Arrastre Creek.This includes the watershed southern headwater areas within the Angeles National Forest.The headwaters of both Kentucky Springs and Aliso Canyon are in the Angeles National Forest, in semi-arid chaparral and desert scrub habitat;however, the drainages themselves support vegetation of desert and interior riparian habitat, which ranges from Great Basin sagebrush inKentuckySprings Wash to dense, mature, willow-cottonwood-sycamore woodlands along permanent streams in Aliso Canyon.The surrounding uplands in the basins support pinyon-juniper woodlands, chamise, mountain mahogany, and manzanita-dominated chaparral, buckwheat scrub, and ruderal lands.The alluvial plain formed along the southern margin of the Santa Clara River basin below these canyons supports intact, high diversity xeric alluvial fan sage scrub.Alluvial terraces within both drainages have been extensively cultivated for orchard crops and dryland agriculture, and in more recent years, rural and urban-type residential developments have encroached on the watersheds.The Kentucky Springs basin has a large population of Parish's Great Basin sagebrush (*Artemisia tridentata* ssp. *parishii*), which is considered rare and sensitive in the County. A population of the federally-threatened red-legged frog (*Rana draytonii* FT, SC) is known to inhabit and breed in the Aliso Canyon watershed.Blum Ranch and another area on Aliso Canyon Road are disturbed, with farming development, but important to continuity of the SEA.The Santa Clara River IBA extends in a branch upstream to include Blum Ranch.

The boundary follows the Santa Clara River channel downstream through the Acton basin, paralleling Soledad Canyon Road on the north side, following the toe of the slope of the San Gabriel Mountains to the south.Boundaries continue along the channel margins to the southwest from Acton to Arrastre Creek, where the southern boundary follows watershed contours to take in four upper tributary channels (Arrastre, Moody, and Bootleggers).Downstream from Acton, there are developed areas as along the Santa Clara River.From a little upstream of the Arrastre Creek confluence to a little downstream in the vicinity of the railroad stop of Lang (about 13 miles of river), the floodplain of the Santa Clara River is designated critical habitat for the federally-endangered arroyo toad (*Anaxyrus californicus*).Some of the confluence area of Mill Canyon is also critical habitat for the

arroyo toad.Part of the area of critical habitat for the toad was also proposed as critical habitat for the state and federally-endangered unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), which is a small three-inch fish that essentially only occurs in the County.It once was widespread throughout the Los Angeles Basin and beyond, but is now restricted to the upper Santa Clara River.The proposal for critical habitat was never approved, and this is now referred to as "essential habitat" for the fish.The type area for the fish is the Arrastre Creek, where it was first collected and described with a museum specimen.

The habitat along the Santa Clara River supports the largest community of riparian-obligate birds between Santa Ynez River in Santa Barbara County and the Prado Basin in Riverside County.In the Soledad Canyon stretch are breeding summer tanager (*Piranga rubra*) and other desert species, along with some instances of least Bell's vireos (*Vireo bellii pusillus*), coastal cactus wrens (*Campylorhynchus brunneicapillus sandiegensis*), and southwestern willow flycatchers (*Empidonax traillii extimus*) from the coastal influence areas.The area is notable for having a combination of species that are characteristic of the desert and characteristic of coastal-influence.

Just west of the confluence with Arrastre Creek the northern boundary loops up to the slopes of Parker Mountain and the eastern watershed of Hughes Canyon around the basal contours of significant rock outcroppings above the river basin, and on the south side, around the Mill Canyon tributary basin.The rocky buttes on the north side of the river, while only a minor part of the watershed of the river, provide important nesting, roosting, and sheltering habitat values for bats, birds of prey, and other sensitive species foraging along the river corridor. The boundaries stay at the river margins west to the watersheds of two northern tributaries, Nellus and Bobcat canyons.These drainages were identified by the South Coast Wildlands Project as important to connectivity across the Santa Clara River between the western and eastern highland areas of the San Gabriel Mountains.

At the Agua Dulce Canyon drainage, the northern boundary loops around the watershed, including the Vasquez Rocks County Natural Area.Agua Dulce Canyon has a permanent stream and supports high quality riparian habitat from the confluence with the river to the intersection with State Route-14. The Santa Clara River IBA extends upstream to include about one mile of the Agua Dulce Canyon.

The Agua Dulce underpass of State Route-14 is an important crossing of the highway barrier for wildlife.From that point, north riparian areas exist where the creeks (Agua Dulce and Escondido) pass through Vasquez Rocks County Natural Area.The Agua Dulce Canyon extension was included in the SEA for its value as a wildlife corridor to provide connectivity across the Santa Clara River between the western and eastern highland areas of the San Gabriel Mountains.The extension includes the watershed of Bee Canyon, which is a downstream tributary of the Santa Clara River.Bee Canyon has an important population of the federally-endangered slender-horned spineflower (*Dodecahema leptoceras*) in its broad, floodplain area.In the Bee Canyon slopes of coastal sage chaparral, the federally-threatened coastal California gnatcatcher (*Polioptila californica californica*) is sometimes resident. The Bee Canyon area has some underpasses of the State Route-14 that could be used by smaller wildlife if maintained unclogged.The extension includes upper watersheds of Spring and Tick canyons to enhance the connective area.Beyond upper areas of Tick Canyon, the SEA boundaries cross Mint Canyon into the Angeles National Forest and the watershed of Rowher Canyon.The SEA continues to the upper reaches of Rowher Canyon onto the main ridgeline of the Sierra Pelona.At the Mint Canyon crossing, just southwest of the community of Sleepy Valley, a lobe of the SEA extends along Mint Canyon to capture riparian woodlands of coast

live oak, with a number of heritage trees (diameters greater than 36 inches).Residences are scattered and the natural communities of chaparral are intact on the canyon slopes.

The southern boundary of the SEA opposite the confluence with Agua Dulce Canyon includes the flood plain.The SEA dips southward into the lower portion of Bear Canyon (tributary of Santa Clara River) and includes undeveloped alluvial terrace slopes of the river downstream of Bear Canyon.The flood plain is a narrowed part of the SEA in the vicinity of Lang, which is a railroad stop on the transcontinental railroad line that runs the length of the Soledad Canyon. Downstream from Lang, the SEA expands to the southern slopes between Lang andOak Spring Canyon, adjacent to the river channel.Downstream of Oak Canyon, the SEA narrows to the flood plain, passes Sand Canyon, and reaches the west ridge of Sand Canyon. A broad finger of the SEA goes south along the ridgeline of the Sand Canyon watershed, where the finger expands when it reaches the watershed of Placerita Canyon.

The alluvial fans of Oak Springs Canyon and Sand Canyon are important recharge grounds for the river aquifer.Surface flows from both canyons enter the Santa Clara River basin through natural, unconfined channels.Recognizing the importance of the Sand Canyon drainage, the SEA boundaries are drawn to encompass the entire upper Sand Canyon watershed, which is largely natural with scattered residences, as well as the Sand Canyon tributary, Bear Canyon.Most of the upper Sand Canyon and its Bear Canyon tributary are within the Angeles National Forest, and Sand Canyon originates on the peak of Magic Mountain.These canyons form a natural movement zone for wildlife traversing among the western end of the San Gabriel Mountains, the eastern end of the Santa Susana Mountains, and the Santa Clara River basin.Together, they encompass a spectrum of significant and unique habitat, vegetation and wildlife resources.The major habitat linkage zones and watersheds between the river basin and the Angeles National Forest, and the protected areas of the County (Placerita Canyon Natural Area), have also been included within the SEA boundary.Near the peak of Magic Mountain, the boundary contours to the southwest, and then proceeds west along the Santa Clara Divide to its intersection with the junction of Interstate-5 and State Route-14.Natural areas of the Sand Canyon watershed, along with the major topography of ridgelines, earthquake escarpments, grasslands, and canyon habitat features and watersheds of Bear, Placerita, Whitney, and Elsmere canyons are the important features of the wildlife linkage.Existing rural residential developments are excluded from the SEA, but the remaining natural highland areas of the western banks of the Sand Canyon watershed are included. These are integral parts of the river basin recharge system and functional ecosystem.

Parts of this area have coastal sage scrub and are critical habitat for the threatened coastal California gnatcatcher.The watershed of Placerita Canyon southeast of the State Route-14 is generally critical habitat for the federally-threatened coastal California gnatcatcher.An area of development surrounding the Placerita Creek near State Route-14 is excluded from the critical habitat.The critical habitat area for the gnatcatcher extends along the east side of State Route-14 beyond Placerita Creek and envelops watersheds into the Angeles National Forest along Whitney Canyon, Elsmere Canyon, and southward over the main ridge of the San Gabriel Mountains, into Grapevine Canyon in its upper natural watershed.Upper areas of these canyons with oaks and big-cone Douglas fir are habitat for the California spotted owl (*Strix occidentalis*)

The eastern half of the Los Piñetos undercrossing of State Route-14 on old oil development roads is included, and focuses on a major wildlife conduit connecting the Santa Susana Mountains to the San Gabriel Mountains, and to the Santa Clara River. The adjacent part of the Santa Susana

Mountainsand Simi Hills SEA includes the west half of the Los Piñetos undercrossing of State Route-14, connecting through the natural oak woodlands and drainages adjacent to the San Fernando Pass.This area, once called “San Francisco” or “Newhall Wedge,” is north and west of the junction of Interstate-5 and State Route-14 with The Old Road running through it.The Newhall Wedge area is nearly all critical habitat for the coastal California gnatcatcher.This critical habitat of the Newhall Wedge is adjacent to the gnatcatcher critical habitat across State Route-14 in the SEA, but is in the Santa Susana Mountains and Simi Hills SEA.

The SEA boundary borders State Route-14 from the north ridge of Grapevine Canyon and heads northeast from the Los Piñetos undercrossing, on the natural side of existing development east of State Route-14.The area around development along Running Horse Road off Placerita Canyonhas been excluded from the SEA.The movie-shoot ranch at the junction of State Route-14 and Placerita Canyon has much area with development or staging excluded, but there is a connected finger of the SEA in Placerita Canyon that leads to the Placerita Canyon watercourse underpass. Much of the watercourse underpass is used by wildlife to transition between the natural areas of Placerita Canyon and the oil field area on the west side of State Route-14.The SEA narrows to the western hills of Sand Canyon beyond the movie-shoot ranch, to avoid developed areas, and continues back to the river margin at Humphreys railway stop, about a 0.4 mile west of its previous point of departure from the river channel.The boundary was drawn to avoid existing major development, but connect the uplands to the river basin.The narrow aperture for the linkage at the Santa Clara River reflects the remnant nature of the last unobstructed terrestrial passageway between the upland areas and the river.

From Sand Canyon westward through the residential neighborhoods of Santa Clarita, the SEA boundary continues on the margins of the flood plain to the confluence with San Francisquito Canyon.The segment of the Santa Clara River passing through the City of Santa Clarita is a dry channel, except during seasonal runoff flows.Some irregular extensions go north into tributaries that have remnant riparian habitat and probable outflows from irrigation runoff that flows into neighborhood storm drains.Regardless of the intermittent nature of water, the river bed elevated areas among braided channels support relatively intact stands of alluvial sage scrub, riparian woodland, and southern riparian scrub.The dry zones are essential to the continued genetic isolation and integrity of the unarmored three-spine stickleback population in the upper reaches of the Santa Clara River.

The boundary extends northward upstream into the reaches of San Francisquito Creek (formerly a separate SEA, but now included with the SEA), following the approved development setback limits, north into the Angeles National Forest (Santa Clara/Mojave Rivers District).The SEA continues nearly the length of the San Francisquito Creek to beyond the junction with South Portal Creek in the vicinity of the community of Green Valley.The Santa Clara River IBA extends in a branch upstream in close proximity to the crossing of Copper Hill Drive.

As the channel enters the Angeles National Forest, flows become less seasonal, and riparian resources expand and diversify.San Francisquito Creek supports dense and mature southern riparian scrub and riparian woodland formations, along with small areas of freshwater marsh, which provide essential wintering areas and resident habitat for waterfowl, wading birds, marshland birds,and a variety of other vertebrate species.The headwaters of San Francisquito Creek are on a low ridge that bounds the San Andreas Fault Zone, and this is an important connective element of the SEA, in that it completes the path from the Pacific Ocean through the mountains to the Mojave

Desert.The sub-watershed and flood plain of the San Francisquito Creek perennial flow in the Angeles National Forest jurisdiction is designated critical habitat for the federally-threatened red-legged frog, which extends from about the Angeles National Forest southern boundary to about one mile south of the junction with Bee Canyon.Much of the San Francisquito Creek is considered essential habitat (one of three areas) for the endangered unarmored threespine stickleback, although the fish has not been found in the San Francisquito Canyon in recent years.

The boundaries west of the confluence with San Francisquito Creek follow the river margins under the Interstate-5 to the Castaic Creek confluence, at which point the northern setback line has been drawn around the lower portion of Castaic Creek, which embraces the riparian habitat areas around and above the confluence. Castaic Creek is the tributary with the largest watershed for the Santa Clara River in the County.The SEA boundaries go upstream about four miles along the watercourse of Castaic Creek to the crossing of Lake Hughes Road, which is just downstream of Castaic Lagoon.The Santa Clara River IBA extends in a branch upstream into Castaic Creek for approximately one mile.

Relatively extensive areas of willow-cottonwood forest and southern riparian scrub occur west of San Francisquito Creek and within the junction zone of Castaic Creek and the Santa Clara River.These river forests support numerous sensitive species and provide multi-layered riparian habitat for a wide diversity of wildlife species, particularly birds of prey and riparian-obligate song birds, such as the federally-endangered least Bell's vireo (*Vireo bellii pusillus*) and the southwestern willow flycatcher (*Empidonax traillii extimus*).

Federally-designated critical habitat for the endangered arroyo toad extends from the east side of Interstate-5, from the junction of the Santa Clara River with San Francisquito Creek, under the Interstate-5, about 5.8 miles to the confluence, with an unnamed drainage just upstream of the confluence of the river with San Martinez Chiquito.The critical habitat area for the toad also includes the flood plain of Castaic Creek as far upstream as the Interstate-5 undercrossing (about 2.5 miles), and for about one mile upstream into the natural area of Hasley Canyon, a tributary of Castaic.Coincident with the critical habitat for the toad is critical habitat for the endangered least Bell's vireo (FE, SE).Critical habitat for the vireo extends along the floodplain from the Rye Canyon undercrossing of the river (west side of Interstate-5), over the Ventura-Los Angeles County line, to about a mile short of the confluence of the Santa Clara River with Piru Creek in Ventura County (about 9 miles).The river area from near Interstate-5 towards the Ventura-Los Angeles County line is "essential habitat" for the threespine stickleback.A disjunct SEA area is on a ridge south of the river bend at Castaic Junction (interchange of Interstate-5 and State Route-126).This area supports a population of the federal candidate and state-endangered San Fernando Valley Spineflower (*Chorizanthe parryi* var. *fernandina*, FC, SE), which is a diminuitive, once-common flower of slopes within the San Fernando Valley and adjacent passes and mountain ranges.The plant became so rare that it was believed to be extinct until it was rediscovered during required surveys for development.

Beyond the confluence with Castaic Creek, the boundaries of the SEA follow the margins of the Santa Clara River channel to the Ventura-Los Angeles County line.The Santa Clara River IBA has a lobelike expansion opposite the confluence with San Martin Chiquito, extending south to cover diverse topography from river cliffs to confluence flood plains in the area around Potrero Canyon.

The Santa Clara River channel and its alluvial terraces and tributary creeks together form the single

most important and natural wildlife movement zone through the County.Mobile species can enter the river basin anywhere along its length (outside of developed areas) and proceed in either direction without having to pass through narrow culverts or blind channels, with continuous vegetative cover and only short stretches of dry substrates.The overall drainage course provides a continuum of aquatic and terrestrial movement opportunities, shelter, forage, and resident habitat from the mouth of the river at Ventura County and the Pacific Ocean, to the Antelope Valley.The drainage course connects to both districts of the Angeles National Forest, and links together three large public resource preserves (Vasquez Rocks and Placerita County Natural Areas and the Angeles National Forest).

Vegetation

Plant communities within the SEA include bigcone Douglas fir-canyon oak forest, coast live oak woodland, coast live oak riparian forest, chaparral, coastal sage scrub, coastal sage scrub-chaparral mixed scrub, non-native and native grasslands, alluvial fan sage scrub, southern cottonwood-willow riparian woodland and forest, southern sycamore-alder woodland, southern willow scrub, vernal pool, pinyon-juniper woodland, juniper woodland, freshwater marsh, and disturbed.Transitional zones (ecotones) between these communities often contain unusual species compositions.Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEA Update Study 2000 Background Report*.Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Bigcone Douglas Fir-Canyon Oak Forest:Typically occurs in higher elevation draws on north-facing slopes, and may have incense cedar (*Calocedrus decurrens*), big-leaf maple (*Acer macrophyllum*), California bay (*Umbellularia californica*), and other shade-loving species intermixed, depending upon slope orientation, substrates, and fire history.Understory vegetation is usually dominated by chaparral species, such as scrub oak (*Quercus berberidifolia*), poison oak (*Toxicodendron diversilobum*), wild grape (*Vitis californica*), and manzanita (*Arctostaphylos* spp.).This community occurs on watershed slopes in the eastern portion of the SEA, and in a few of the narrower, more mesic canyons along the southern side of Soledad Canyon.

Corresponding MCV communities:

- *Pseudotsuga macrocarpa* (bigcone Douglas-fir forest)Forest Alliance
- *Quercus chrysolepis* (canyon live oak forest) Forest Alliance

Coast Live Oak Woodland:Consists of moderate-density overstory formations of coast live oak trees (*Quercus agrifolia* var. *agrifolia*), usually on erosional plains or landslides along the margins of canyon bottoms and on lower slopes in chaparral and coastal sage scrub understory habitats.Western blue elderberry (*Sambucus nigra* var. *caerulea*), chaparral currant (*Ribes malvaceum*), skunk bush (*Rhus aromatica*), and California peony (*Paeonia californica*) are frequent in the understory.Extensive stands of this formation occur in Sand, Placerita, Bear, Whitney, Elsmere, and Soledad canyons, and in unnamed tributary canyons to these drainages.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance

Coast Live Oak Riparian Forest:A variation of coast live oak woodland wherein the canopy is more closely grown, and the trees occur in narrower formations along watercourses.Willow (*Salix* spp.), California bay, mulefat (*Baccharis salicifolia*), and other riparian species often occur in the understory.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance

Juniper Woodland:An open formation dominated by California juniper (*Juniperus californica*), often with an understory of foothill yucca (*Yucca whipplei*), California buckwheat (*Eriogonum fasciculatum*), and other scrub species.This community is found on lower slopes within the eastern portion of the SEA and is mixed with a few Joshua trees and chaparral species in several places.

Corresponding MCV communities:

- *Juniperus californica* (California juniper woodland) Woodland Alliance

Pinyon-Juniper Woodland:In the SEA, pinyon-juniper woodland typically consists of a mixture of singleleaf pinyon pine (*Pinus monophylla*) and California juniper, with mountain mahogany (*Cercocarpus betuloides*), California buckwheat, skunk bush, foothill yucca, penstemons (*Penstemon* spp.), and native grasses (*Stipa*, *Poa*, *Elymus*, etc.).This formation occurs on middle elevation north-facing slopes in the Kentucky Springs watershed, and sporadically along the same orientations south of Acton.

Corresponding MCV communities:

- *Pinus monophylla* (singleleaf pinyon woodlands) Woodland Alliance
- *Juniperus californica* (California juniper woodland)Woodland Alliance

Southern Cottonwood-Willow Riparian Woodland and Forest:A broad-leafed winter-deciduous habitat dominated by Fremont cottonwood (*Populus fremontii*), various species of willow, and occasional alder (*Alnus rhombifolia*) and western sycamore (*Platanus racemosa*).Southern cottonwood-willow riparian woodland (or forest) occurs in numerous reaches of the SEA, forming mature overstory habitat on the Santa Clara River, its main tributaries, oxbow ponds, and alluvial plains.Some of the most extensive formations occur just west of Acton, in upper Aliso Canyon, in lower San Francisquito Canyon, and from Santa Clarita to the Ventura-Los Angeles County line.Large tracts of cottonwood-willow habitat occur in Ventura County as well.

Corresponding MCV communities:

- *Populus fremontii* (Fremont cottonwood forest) Forest Alliance
- *Salix laevigata* (red willow thickets) Woodland Alliance
- *Salix gooddingii* (black willow thickets) Woodland Alliance

Southern Sycamore-Alder Woodland:A formation that most often occurs on broad plains with heavy

alluvial substrates, as well as along narrow creeks and streams with high-energy, permanent flows within the SEA.Alders typically occur along the watercourse, while sycamores usually grow a bit further from the active flowing channel.This community is rare within the SEA, as it occurs in only the upper reaches of the watershed and in portions of Bear, Sand, and Placerita canyons and to a lesser extent in Aliso Canyon.

Corresponding MCV communities:

- *Platanus racemosa* (California sycamore woodlands) Woodland Alliance
- *Alnus rhombifolia* (white alder groves) Forest Alliance

Southern Willow Scrub: is a riparian community consisting of dense, broad-leafed, winter-deciduous riparian thickets that occur within and adjacent to seasonal or permanent watercourses.The “scrub” generally is sub-mature, which is a state that often is maintained by frequent heavy over-flooding.The trees attain woodland or forest stature if undisturbed for several decades.Dominant species of this community within the SEA are mulefat, sandbar willow (*Salix exigua*), and arroyo willow (*Salix lasiolepis*).Within the SEA, this community occurs throughout the tributary and primary drainages, wherever the habitat structure is maintained or repeatedly altered by frequent high water flows.

Corresponding MCV communities:

- *Salix exigua* (sandbar willow thickets) Shrubland Alliance
- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance

Freshwater Marsh:Develops in areas of still or slow-moving permanent freshwater.This community is dominated by the perennial, emergent cattail (*Typha* spp.) or bulrush (*Schoenoplectus* spp.), which can reach heights of seven feet and grow dense enough to form a closed canopy.This vegetation occurs in scattered ponds and slow-flowing portions of the river and tributaries within the SEA.

Corresponding MCV communities:

- *Phragmites australis* (common reed marshes) HerbaceousAlliance and Semi-Natural Stands
- *Schoenoplectus californicus* (California bulrush marsh) Herbaceous Alliance
- *Typha* (*angustifolia*, *domingensis*, *latifolia*)(cattail marshes)Herbaceous Alliance
- *Lemna* (*minor*) *and relatives* (duckweed blooms) ProvisionalHerbaceous Alliance

Vernal Pool Systems: Extremely rare in the County.There are only two verified vernal pools currently recognized within the Santa Clara River watershed area:Cruzan Mesa and Plum Canyon.The SEA has been designated for these vernal pools.There are probably unrecognized ephemeral pools all along the river course where soil types are appropriate.For example, there is at least one small documented seasonal pond with typical vernal pool characteristics within the Golden Valley Ranch portion of the upper Placerita-Sand Canyon watershed.This small pool is surrounded by coastal sage scrub, with a band of native needlegrass and melic grass on its fringes.The Golden Valley pool

supports Riverside fairy shrimp and western spadefoot toad.It is considered a vernal pool by virtue of its habitat values and species that are unique to this type of seasonal formation.

Corresponding MCV communities:

- *Deinandra fasciculata* (clustered tarweed fields) Herbaceous Alliance
- *Eleocharis macrostachya* (pale spike rush marshes) Herbaceous Alliance
- *Lasthenia californica-Plantago erecta-Vulpia microstachys* (California goldfields-dwarf plantain - six-weeks fescue flower fields) Herbaceous Alliance
- *Juncus arcticus* (var. *balticus*, *mexicanus*) ([*Juncus balticus* ssp. *ater*, *Juncus mexicanus*] Baltic and Mexican rush marshes) Herbaceous Alliance

Chaparral:Consists of sclerophyllous (hard-leaved, evergreen), medium height to tall shrubs that form a dense cover on steep slopes, usually below 5,000 feet in Southern California. Dominant species found within this community include scrub oaks (*Quercus*, several species), chamise, manzanita, wild lilac (*Ceanothus* spp.), toyon (*Heteromeles arbutifolia*), and western mountain-mahogany on north-facing exposures; buckwheat, foothill yucca, chamise, hoary-leaf lilac (*Ceanothus cuneatus*), black sage (*Salvia mellifera*), and goldenbush (*Ericameria linearifolia*) on south-facing slopes. This plant community occupies most of the basin slopes along the Santa Clara River and on interior ridges and slopes within the watersheds and drainages west of Acton. Chaparral also occurs on some of the higher elevations of the eastern watershed portions of the SEA, where the shrubs frequently are interspersed as understory formations within oak and conifer woodlands.

Corresponding MCV communities:

- *Adenostoma fasciculatum* (chamise chaparral)Shrubland Alliance
- *Adenostoma fasciculatum-Salvia apiana* (chamise- white sage chaparral) Shrubland Alliance
- *Arctostaphylos glandulosa* (Eastwood's manzanita chaparral) Shrubland Alliance
- *Arctostaphylos glauca* (bigberry manzanita chaparral) Shrubland Alliance
- *Ceanothus cuneatus* (hoary leaf ceanothus chaparral) Shrubland Alliance
- *Ceanothus greggii* [*vestitus*](cup leaf ceanothus chaparral) Shrubland Alliance
- *Ceanothus leucodermis* (chaparral whitethorn) Shrubland Alliance
- *Prunus ilicifolia* (holly leaf cherry chaparral) Shrubland Alliance

Coastal Sage Scrub and Coastal Sage Scrub-Chaparral Mixed Scrub:Formations that typically occur on south or west-facing slopes within the western portion of the SEA.Some sites may be artifacts of fire frequency or occurrence, while other areas appear to be stable scrub communities.Dominant species are typically California sagebrush (*Artemisia californica*), purple sage (*Salvia leucophylla*),

black sage, white sage (*S. apiana*), goldenbush, buckwheat, foothill yucca, California brittle bush (*Encelia californica*), golden yarrow (*Eriophyllum confertiflorum*), chamise, hoary-leaf lilac, and a variety of annuals and bulbs.Excellent examples of coastal sage scrub occur in upper Placerita Canyon watershed and on the ridgeline to the north, along the Santa Clara River just east of Sand Canyon, and in San Francisquito Canyon.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Dendromecon rigida* (bush poppy scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub) Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Eriogonum fasciculatum-Salvia apiana* (California buckwheat-white sage scrub) Shrubland Alliance
- *Ericameria linearifolia* (narrowleaf goldenbush scrub) Provisional Shrubland Alliance
- *Lotus scoparius* ([*Acmispon glaber*] deer weed scrub) Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub)Shrubland Alliance

Alluvial Fan Sage Scrub:Sometimes also known as floodplain sage scrub, generally consists of a mixture of shrubs, which colonize and persist within infrequently scoured and flooded terrain, such as floodplains, alluvial plains, or along seasonal streams.The dominant shrub in most washes is scalebroom (*Lepidospartum squamatum*), but thick leaf yerba santa (*Eriodictyon crassifolium*), Great Basin sagebrush, rabbitbrush (*Ericameria nauseosa*), skunk bush, hollyleaf cherry (*Prunus ilicifolia*), and foothill yucca also usually occur in the habitat type, and may be dominant, depending upon substrates and subsurface hydrology.This vegetation type is common throughout the alluvial plains and washes in the SEA, and form particularly high diversity stands along the southern margin of the river at Acton, on uplands east of the Sand Canyon confluence, along the dry reaches of the river in Santa Clarita, and in lower San Francisquito Canyon.Extensive stands of Parish's Great Basin sagebrush-dominated alluvial scrub occur around Acton and in the Kentucky Springs portion of the SEA.Lower reaches of tributary drainages to the Santa Clara River often support unusual vegetation

types (not addressed in the MCV) with dominance by hollyleaf cherry.In addition, the Santa Clara River floodplain provides an avenue of westward range extension for a small number of species more typically associated with the Mojave Desert flora and otherwise not expected within the cismontane region of Southern California.These include sandpaper plant (*Petalonyx thurberi*) and arrow weed (*Pluchea sericea*).

Corresponding MCV communities:

- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Artemisia tridentata* (big sagebrush) Shrubland Alliance
- *Eriodictyon crassifolium* (thick leaf yerba santa scrub) Provisional Alliance
- *Eriogonum fasciculatum-Salvia apiana* (California buckwheat-white sage scrub)Shrubland Alliance
- *Lepidospartum squamatum* (scale broom scrub) Shrubland Alliance
- *Malosma laurina* (laurel sumac scrub)Shrubland Alliance

Native and Non-Native Grassland Communities:Consist of low, herbaceous vegetation dominated by grasses, with native formations generally mixed with native bulbs and other herbaceous species, and often intermixed with naturalized annual taxa.There are representatives of native grasslands scattered within the SEA, most notably patches of different needlegrass (*Stipa*) species and melic (*Melica*) grasses on clay soils in Placerita Canyon, on slope wetlands and around oak woodlands on the ridge north of Placerita Canyon, and on less-disturbed xeric slopes in the eastern portion of the SEA.Seeps in chaparral often support homogeneous stands of giant wildrye (*Leymus condensatus*). Other native grasses occur sporadically within most natural habitats along the Santa Clara basin.

Non-native grassland consists of invasive annual grasses that are primarily of Mediterranean origin.Dominant species within this community include wild oats (*Avena* spp.), bromes (*Bromus* spp.), and other grasses, along with wild mustards (*Brassica*, *Hirschfeldia*, and *Sisymbrium* spp.)and other disturbance-facilitated “weedy” taxa.Non-native grasslands and other ruderal formations are the dominant understory on most disturbed substrates, particularly grazed areas.

Corresponding MCV communities:

- *Leymus condensatus* (giant wild rye grassland) Herbaceous Alliance
- *Nassella* [*Stipa*] *cernua* (nodding needle grass grassland) Provisional Herbaceous Alliance
- *Nassella* [*Stipa*] *lepida* (foothill needle grass grassland)Provisional Herbaceous Alliance
- *Nassella* [*Stipa*] *pulchra* (purple needle grass grassland) Herbaceous Alliance
- *Avena* (*barbata*, *fatua*)(wild oats grasslands) Semi-Natural Herbaceous Stands

- *Brassica* (*nigra*) *and Other Mustards* (upland mustards) Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus,hordeaceus*)-*Brachypodium distachyon* (annual brome grasslands) Semi-Natural Herbaceous Stands
- *Bromus rubens-Schismus* (*arabicus*, *barbatus*)([*Bromus madritensis*ssp.*rubens*] red brome or Mediterranean grass grasslands)Semi-Natural Herbaceous Stands
- *Centaurea* (*solstitialis*, *melitensis*)(yellow star-thistle fields)Semi-Natural Herbaceous Stands
- *Lolium perenne* [*Festuca perennis*] (perennial rye grass fields)Semi-Natural Herbaceous Stands

Disturbed or Barren Areas:These areas either completely lack vegetation or are dominated by ruderal species.Ruderal vegetation typically found within the SEA includes non-native and native grasses and “weedy” herbaceous species, including doveweed, mustards, wire lettuce, sow thistle, telegraph weed, Russian thistle, dock, yellow star thistle, Australian saltbush, and cocklebur.Disturbed areas occur throughout the SEA on fallow agricultural sites, disked fields, abandoned pastures, residential development, paved road margins, fire breaks, dirt access roads, trails, and other similarly disturbed areas.

Corresponding MCV communities:

None at this time.

In a 2006 report submitted to PCR by South Coast Wildlands, in cooperation with the Upper Santa Clara Biodiversity Work Group, entitled *Wildlands of the Santa Clara River Watershed: Restoring and Maintaining the Integrity and Health of the River and its Watershed*, indicate several plant communities not previously identified as being present in the area.Desert scrub and Joshua tree woodland were described as being present in the eastern part of the watershed. Mainland hollyleaved cherry woodland was also identified as a sensitive plant community that is common in the area and is included above as a subset of chaparral, *Prunus ilicifolia* (holly leaf cherry chaparral) Shrubland Alliance.

Wildlife

Wildlife within the SEA is extremely diverse and abundant, commensurate with extensive acreages of natural open space and the great diversity of habitat types within the Santa Clara River channels and on the surrounding uplands.While a few wildlife species may be entirely dependent upon or obligate within a single vegetative community, the mosaic of vegetation communities within the SEA and adjoining uplands constitutes a continuum of functional ecosystems.These ecosystems support a wide variety of wildlife species, within the SEA boundaries and as a part of the regional ecosystem.

Analysis of invertebrates on any given site generally is limited by a lack of specific data, but the size of the SEA and diversity of habitats present are considered sufficient to support healthy populations of a very large number of invertebrate species, probably in excess of 2,500 species.The riparian formations, wetlands, and aquatic habitats within the SEA support diverse faunas of arthropods, including native fairy shrimp, craneflies, blackflies and other aquatic dipterans, stoneflies, caddisflies, and dobsonflies, water boatmen, giant water bugs, ground beetles, diving beetles, and tiger beetles.Terrestrial insects occur around riparian corridors and in scrub habitats, and are particularly

abundant in oak-dominated habitats.Insect orders are very well-represented taxonomically, and with some habitat specialization within the SEA include orthoptera, neuroptera, coleoptera, diptera, hymenoptera and lepidoptera.

Amphibians are abundant and relatively diverse within moister woodland areas, along montane canyon bottoms, in riparian areas, and within surface water features of the SEA.The overall riparian systems of the Santa Clara River basin support abundant populations of California and Baja California chorus frogs (*Pseudacris cadaverina*, *P. hypochondriaca*), California toad (*Anaxyrus boreas halophilus*), western spadefoot toad (*Spea hammondii*), American bullfrog (*Lithobates catesbeianus*), and African clawed frog (*Xenopus laevis*)—of which the latter two species are non-native.San Francisquito Canyon also supports populations of California red-legged frog (*Rana draytonii*) and arroyo toad (*Anaxyrus californicus*).Arboreal salamander (*Aneides lugubris*), garden slender salamander (*Batrachoseps major*), and painted ensatina (*Ensatina eschscholtzii picta*) are also present within mesic habitats in the SEA.

Open scrub, chaparral and alluvial fan habitats support diverse reptile populations, and the overall herpetofauna of the SEA includes numerous lizard species, along with southwestern pond turtle (*Emys marmorata*) in Agua Dulce and Bear canyons, as well as some parts of the main river channel.Yucca night lizard (*Xantusia vigilis*), western side-blotched lizard (*Uta stansburiana elegans*), Great Basin fence lizard (*Sceloporus occidentalis longipes*), Skilton's skink (*Plestiodon skiltonianus skiltonianus*), San Diego alligator lizard (*Elgaria multicarinata webbii*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), coast horned lizard (*Phrynosoma blainvillii*), California legless lizard (*Anniella pulchra*), and San Diego banded gecko (*Coleonlyx variegatus abbotti*) would be expected within the SEA.

The SEA also supports a robust snake fauna, including desert threadsnake (*Rena humilis cahuilae*), red racer (*Coluber flagellum piceus*), California striped racer (*Coluber lateralis lateralis*), coast patch-nosed snake (*Salvadora hexalepis virgultea*), northern three-lined boa (*Lichanura orcutti*), San Diego gopher snake (*Pituophis catenifer annectens*), California glossy snake (*Arizona elegans occidentalis*), California kingsnake (*Lampropeltis getula californiae*), California mountain kingsnake (*Lampropeltis zonata*), long-nosed snake (*Rhinocheilus lecontei*), San Diego nightsnake (*Hypsiglena ochrorhyncha klauberi*), Baja California lyresnake (*Trimorphodon biscutatus lyrophanes*), western black-headed snake (*Tantilla planiceps*), two-striped garter snake (*Thamnophis hammondii*), San Bernardino ring-necked snake (*Diadophis punctatus modestus*), and southern Pacific rattlesnake (*Crotalus oreganus helleri*).

Bird diversity within the SEA is related to habitat opportunities for year-round residents, seasonal residents, migrating raptors, and song birds.Coastal sage scrub and chaparral host a suite of birds that are typical of such sites at lower elevations over most of the coastal slopes of Southern California.The most productive sites for resident coastal sage scrub and chaparral birds are around riparian and freshwater systems, which also attract large numbers of migrants during the spring and fall.Coastal sage and chaparral birds resident or breeding within the SEA include California quail (*Callipepla californica*), greater roadrunner (*Geococcyx californianus*), black-chinned hummingbird (*Archilochus alexandri*), Anna's hummingbird (*Calypte anna*), Costa's hummingbird (*C. costae*), coastal California gnatcatcher (*Polioptila californica californica*), northern mockingbird (*Mimus polyglottos*), California thrasher (*Toxostoma redivivum*), phainopepla (*Phainopepla nitens*), spotted towhee (*Pipilo maculatus*), Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), California towhee (*Melozone crissalis*), black-chinned sparrow (*Spizella atrogularis*),

lark sparrow (*Chondestes grammacus*), Bell's sage sparrow (*Amphispiza belli belli*), and lazuli bunting (*Passerina amoena*).Oak woodlands and riparian areas support many more species. Notable species include band-tailed pigeon (*Patagioenas fasciata*), western wood-pewee (*Contopus sordidulus*), summer tanager (*Piranga rubra*), black-headed grosbeak (*Pheucticus melanocephalus*), Bullock's oriole (*Icterus bullockii*), several swallow species, western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), southwestern willow flycatcher (*Empidonax traillii extimus*), and least Bell's vireo (*Vireo bellii pusillus.Species associated with ruderal sites and grasslands include California horned lark* (*Eremophila alpestris actia*), savannah sparrow (*Passerculus sandwichensis*), and grasshopper sparrow (*Ammodramus savannarum*).Birds of prey (*including common migrants*) observed within the SEA include white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*Buteo jamaicensis*), golden eagle (*Aquila chrysaetos*), American kestrel (*Falco sparverius*), merlin (*Falco columbarius*), and prairie falcon (*Falco mexicanus*).Resident owl species within the SEA boundaries include barn owl (*Tyto alba*), great horned owl (*Bubo virginianus*), long eared owl (*Asio otus*), and California spotted owl (*Strix occidentalis occidentalis*).

Native mammal diversity within the SEA is considerable.These include bats (at least seven species), rodents (at least four species of deer mice, two species of woodrat, Beechey ground squirrel, western gray squirrel, and more), two types of rabbits and one hare, mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), common gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), cougar (*Puma concolor*), striped skunk (*Mephitis mephitis*), western spotted skunk (*Spilogale gracilis*), long-tailed weasel (*Mustela frenata*), American badger (*Taxidea taxus*), northern raccoon (*Procyon lotor*), and broad-footed mole (*Scapanus latimanus*).Black bear (*Ursus americanus*) also occur within the SEA boundaries, at least occasionally, but the San Gabriel Mountains population was introduced for game use, and this species is not native within the SEA.

Wildlife species previously recorded, as well as those expected to occur, within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEA Update Study 2000 Background Report*.Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

Historically (and prehistorically) the riparian corridor along the Santa Clara River has served as the primary east-west linkage between the Pacific coastline, coast ranges, interior ranges, high desert and southern Sierra (via the Tehachapi Range). Animals moving through the Santa Clara drainage had unobstructed passage along the river and within the riparian systems between the coastal lowlands of Ventura County and the Mojave Desert. The tributary routes extend south into the Santa Susana Mountains, south and north into the San Gabriel Mountains, northward via Castaic, Bouquet and San Francisquito tributaries (over the coastal ranges and San Gabriel Mountains of the Transverse Ranges and into the San Joaquin Valley), west into the central coast ranges, or east through the Tehachapi Mountains, and into the southern Sierra Nevada. The present configuration of the tributary drainages has impinged upon connectivity from the Santa Clarita Valley to the north, but the Santa Clara River remains relatively intact and open. The SEA embraces the river corridor and the linkage zones that are considered essential to ensuring connectivity and resource values within the historic movement zones for all of the wildlife species present within the County portion of the Santa Clara River, including mountain lion, coyote, bobcat, and several medium-sized mammals, as

well as birds, reptiles, amphibians, and fishes.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas."Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species. Species with critical habitat in the SEA include the red-legged frog, arroyo toad, least Bell's vireo, and coastal California gnatcatcher. A species with essential habitat (critical habitat was proposed but not designated for species listed before 1978) is the unarmored threespine stickleback (fish).

Sensitive Plan Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.These communities include bigcone Douglas-fir forest, Fremont cottonwood forest, black willow thickets, California sycamore woodlands, clustered tarweed fields, chamise-white sage chaparral, holly leaf cherry chaparral, California brittle bush scrub, white sage scrub, California buckwheat-white sage scrub, narrowleaf goldenbush scrub, thick leaf yerba santa scrub, scale broom scrub, giant wild rye grassland, nodding needle grass grassland, foothill needle grass grassland, and purple needle grass grassland.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Nevin's barberry (*Berberis nevinii*)FE, SE, RPR 1B.1
- Round-leaved filaree (*California macrophylla*)RPR 1B.1
- Peirson's morning-glory (*Calystegia peirsonii*)RPR 4.2
- Southern tarplant (*Centromadia parryi* ssp. *australis*)RPR 1B.1
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)FC, SE, RPR 1B.1

- Slender-horned spineflower (*Dodecahema leptoceras*)FE, SE, RPR 1B.1
- Palmer's grapplinghook (*Harpagonella palmeri*)RPR 4.2
- Newhall sunflower (*Helianthus inexpectatus*)RPR 1B.1
- Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*)RPR 1A
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)RPR 1B.1
- Davidson's bushmallow (*Malacothamnus davidsonii*)RPR 1B.2
- Moran's navarretia (*Navarretia fossalis*)FT, RPR 1B.1
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*)RPR 2.2
- Chaparral ragwort (*Senecio aphanactis*)RPR 2.2
- Mason's neststraw (*Stylocline masonii*)RPR 1B.1
- Greata's aster (*Symphyotrichum greatae*)RPR 1B.3
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)RPR 1B.2
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2
- California Orcutt grass (*Orcuttia californica*)RPR FE, SE, 1B.1

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Riverside fairy shrimp (*Streptocephalus woottoni*)FE
- Santa Ana sucker (*Catostomus santaanae*)FT, FSS, SSC
- Unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*)FE, FSS, SE, ~~CDFG~~CDFW Fully Protected
- Arroyo chub (*Gila orcuttii*)FSS, SSC
- Arroyo toad (*Anaxyrus californicus*)FE, SSC
- California red-legged frog (*Rana draytonii*)FT, SSC
- Western spadefoot (*Spea hammondii*)BLMS, SSC
- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC

- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- Rosy boa (*Charina trivirgata*)BLMS, FSS
- Western pond turtle (*Emys marmorata*)BLMS, FSS, SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Coast patch-nosed snake (*Salvadora hexalepis virgultea*)SSC
- Two-striped garter snake (*Thamnophis hammondii*)BLMS, FSS, SSC
- Cooper's hawk (*Accipiter cooperii*)~~CDFG~~CDFW Watch List
- Tricolored blackbird (*Agelaius tricolor*)BCC, BLMS, SSC, USBC, AWL, ABC
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Grasshopper sparrow (*Ammodramus savannarum*)~~CDFG~~CDFW Special Animals List
- Bell's sage sparrow (*Amphispiza belli belli*)BCC, ~~CDFG~~CDFW Watch List
- Golden eagle (*Aquila chrysaetos*)BCC, BLMS, ~~CDFG~~CDFW Watch List, ~~CDFG~~CDFW Fully Protected, CDF
- Burrowing owl (*Athene cunicularia*)BCC, BLMS, SSC
- Ferruginous hawk (*Buteo regalis*)BCC, BLMS, ~~CDFG~~CDFW Watch List, AWL, LAA
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)FC, BCC, FSS, SE
- Yellow warbler (*Dendroica petechia brewsteri*)SSC
- White-tailed kite (*Elanus leucurus*)~~CDFG~~CDFW Fully Protected
- Southwestern willow flycatcher (*Empidonax traillii extimus*)FE, FSS, SE, USBC, AWL, ABC
- California horned lark (*Eremophila alpestris actia*)~~CDFG~~CDFW Watch List, LAA
- Prairie falcon (*Falco mexicanus*)BCC, ~~CDFG~~CDFW Watch List, LAA
- American peregrine falcon (*Falco peregrinus anatum*)BCC, FSS, SE, CDF, ~~CDFG~~CDFW Fully Protected, AWL, ABC
- California condor (*Gymnogyps californianus*)FE, SE, CDF, ~~CDFG~~CDFW Fully Protected, USBC, AWL, ABC
- Yellow-breasted chat (*Icteria virens*)SSC

- Loggerhead shrike (*Lanius ludovicianus*)BCC, SSC, LAA
- Coastal California gnatcatcher (*Polioptila californica californica*)FT, SSC, USBC, AWL, ABC
- Bank swallow (*Riparia riparia*)ST
- Least Bell's vireo (*Vireo bellii pusillus*)FE, BCC, SE, USBC, AWL, ABC
- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Pallid San Diego pocket mouse (*Chaetodipus fallax pallidus*)SSC
- Spotted bat (*Euderma maculatum*)BLMS, SSC, WBWG High
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Silver-haired bat (*Lasionycteris noctivagans*)WBWG Medium
- Hoary bat (*Lasiurus cinereus*)WBWG Medium
- Western yellow bat (*Lasiurus xanthinus*)WBWG High
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)SSC
- California leaf-nosed bat (*Macrotus californicus*)FSS, SSC, WBWG High
- Fringed myotis (*Myotis thysanodes*)BLMS, WBWG High
- Long-legged myotis (*Myotis volans*)BLMS, SSC, WBWG Medium
- Yuma myotis (*Myotis yumaensis*)BLMS, WBWG Low-Medium
- San Diego desert woodrat (*Neotoma lepida intermedia*)SSC
- Big free-tailed bat (*Nyctinomops macrotis*)SSC, WBWG Medium-High
- Southern grasshopper mouse (*Onychomys torridus ramona*)SSC
- American badger (*Taxidea taxus*)SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE SANTA CLARA RIVER SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	The only existing natural population of the federally-endangered unarmored three-spine stickleback is within the Santa Clara River and its tributaries, and all of its essential habitat is in this SEA. The federally-threatened Santa Ana sucker occurs in the river, as does the state species of concern, the arroyo chub. The population of state and federally-endangered slender-horned spineflower in Bee Canyon is one of fewer than seven known occurrences for this species, one of only two known occurrences in the County, and one of its largest populations.San Francisquito Creek has a breeding area for the endangered red-legged frog. The San Fernando Valley spineflower (at Newhall Ranch in Interstate-5 vicinity) is found in only a few nearby places. Some of the critical habitat for the threatened California coastal gnatcatcher is included in this SEA.Western spadefoot, which is a species of concern, is extremely rare and local in the County away from this SEA. One of the largest, if not largest populations of least Bell's vireo in the County occurs along the river in the vicinity of the crossing of Interstate-5 near Newhall Ranch. Many RPR-listed rare plants occur within the SEA.Critical habitat occurs in the SEA for the listed arroyo toad, the red-legged frog, the coastal California gnatcatcher, and the least Bell's vireo.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The low-elevation bigcone Douglas fir-canyon oak forests above Placerita Canyon, the vernal pool in the Placerita Canyon-Sand Canyon divide, the native grassland on the Golden Valley Ranch (upper Placerita Canyon), and the alluvial fans with sage scrub in lower San Francisquito Canyon, Kentucky Springs and Acton are unique and regionally restricted biotic communities.Additionally, the riparian forests and woodlands along the Santa Clara River are among the most extensive, diverse and intact vegetative stands of this type in Southern California.Rare aquatic species, such as the unarmored three-spined stickleback, Santa Ana sucker, red-legged frog, least Bell's vireo, summer tanager, spineflower, and many others represented within the SEA are found nowhere else in the region.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The cottonwood-willow forests and woodlands, alluvial fan sage scrub, and coast live oak riparian forest are best represented in the County within the SEA.The lower elevation examples of bigcone Douglas fir-canyon oak forest communities where they mix with low-elevation biota are restricted to the edges of mountain habitat communities, which are regionally rare and also designated in this SEA.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited	Met	The Santa Clara River is simultaneously an oasis running through a dry landscape and an extension of coastal conditions into the dry interior. For this reason, it supports unique populations of aquatic and amphibious species, as well as aridlands species extending towards the coast and coastal species' extension inland. It is a

Criterion		Status	Justification
	in availability either regionally or in the County.		principle migratory route for the County plants and animals and a center of diversity for the County. The Santa Clara River and its tributaries provide breeding opportunities for numerous species otherwise not known to breed within the County, including California red-legged frog, summer tanager, southwestern willow flycatcher, and the unarmored three-spined stickleback . The extensive riparian areas shelter dozens of migrant songbird species during winter, including high concentrations of white-crowned and golden-crowned sparrows, fox sparrow, yellow-rumped warbler, dark-eyed junco, and sharp-shinned hawk. The SEA embraces the river corridor and the linkage zones that are considered essential to ensuring connectivity and resource values for many of the wildlife species that are present within the County portion of the Santa Clara River.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The Santa Clara River represents a unique example of a drainage that stretches from the desert to the coast through the mountains. Its resources are, by definition, present at their geographic extremes. Plants such as western juniper, snake cholla, basin sagebrush, and birds, such as summer tanager are at the southwestern edges of their ranges along the river. Coastal taxa extend to the headwaters in the Acton area. High elevation species, such as bigcone Douglas fir, spotted owl, and Steller's jay occur at fairly low elevations at the edges of Santa Clara River valley, on north facing slopes that remain cool all summer.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The SEA encompasses some of the highest quality, least disturbed and biotically intact acreage of bigcone Douglas-fir-canyon oak forest, riparian forest and woodland, coastal sage scrub, and alluvial fan sage scrub that remains in the County, and one of the three known vernal pools along the river.Vernal pools are rare everywhere in California.

In conclusion, the area is an SEA because it contains:A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) numerous examples of species at their habitat extremes as the coastal and desert influences meet; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Santa Felicia SEA

Location

General

The Santa Felicia Significant Ecological Area (SEA) is located northwest of the City of Santa Clarita

within unincorporated area of the County. Some of the SEA extends into the Angeles National Forest. The area is west of the Interstate-5, north of State Route-126 and encompasses almost the entire County portion of the Santa Felicia watershed that drains into Lake Piru and Piru Creek. Piru Creek has the largest watershed of any tributary of the Santa Clara River. The SEA is largely composed of natural coastal slopes of the western San Gabriel Mountains, with south-facing slopes of coastal sage scrub and grasslands, north-facing slopes of oak woodland and chaparral, and canyons of riparian oak forest and other riparian habitats.This habitat has beendiminished by development, and the SEA is one place in the County where the natural habitat remains.

The SEA is located at least partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles: Whitaker Peak and Val Verde.

General Boundary and Resources Description

Starting at the north end of the SEA boundary on the Ventura-Los Angeles County line, the northern SEA boundary is about one-quarter to one-half mile north of the boundary of Angeles National Forest, with private property as it follows along the northern ridgeline of Devil Canyon. Most of the SEA captures the natural, coastal sage scrub-covered south-facing slopes, oak-forests and mixed chaparral of the north-facing slopes, and deep ravines with riparian oak forest in the canyons.Devil Canyon is a major tributary of Piru Creek (at Lake Piru) in Ventura County.Where the Devil Canyon watershed contacts the southern ridgeline off Townsend Peak, the SEA boundary turns south along a ridge that separates Santa Felicia Canyon and its tributaries on the west side, from Palomas Canyon on the east side. The boundary goes south out of the Angeles National Forest into private lands about a 0.75 mile south of Townsend Peak. To capture the watershed tributaries, the eastern boundary follows the dominant ridgeline between Palomas Canyon and Santa Felicia Canyon, and then between Santa Felicia Canyon and Violin Canyon after Palomas Canyon joins Violin Canyon. There is a triple divide for the watersheds of Violin Canyon (which joins Castaic Creek), the watershed of Romero Canyon, which joins Hasley Canyon before it joins Castaic Canyon, andSanta Felicia Canyon, which is a tributary of Piru Creek.At the triple divide, the SEA boundary turns west to follow the ridge of the Santa Felicia watershed.The boundary crosses Loma Verde (peak), where it separates Santa Felicia Canyon from Romero Canyon, and the unnamed headwater creeks of Hasley Canyon, excluding the rapidly developing areas. About a mile southwest of Loma Verde Canyon, the SEA boundary turns south and west to encompass the watershed of Oak Canyon, with coast live oaks and riparian forest. The SEA boundary goes north along the Ventura-Los Angeles County line, crossing riparian forest of Santa Felicia Canyon and Devil Canyon into the Angeles National Forest, where it joins the north ridge of Devil Canyon.Most of the SEA is included in the wildlife movement linkage Sierra Madre-Castaic Connection that was outlined by the South Coast Wildlands study of linkages (Penrod, *et al*. 2005).

The SEA includes a wide variety of topographic features and habitat types.The orientation and extent of the SEA encompasses the surface and subsurface hydrology of the Santa Felicia watershed, from its headwater, tributaries, and basin to the point at which it exits the County jurisdiction.

The SEA encompasses most of the County portion of the Santa Felicia watershed that drains into Lake Piru.This watershed is largely undeveloped and contains vast stands of coastal sage scrub and chaparral communities on south- and north-facing slopes.In addition to the undisturbed upland habitats, the watershed includes examples of mixed riparian (sycamore-willow), oak riparian and

coast live oak forests and alluvial scrub in the bottomlands.Grasslands occur in areas where grazing may have taken place; however, there is little invasion of these ruderal taxa into the native communities.A brief summary of the plant communities present, or likely to occur, within the SEA is provided in the Vegetation section.

Vegetation

The plant communities within the SEA are composed of numerous plant species.These plant species are adapted to a Mediterranean climate with a cool, wet season followed by a hot, dry season.Due to the topographic complexity and coastal and desert influences, the SEA supports a wide diversity of plant species.

Plant communities within the SEA include: coast live oak woodland, coast live oak riparian forest, chaparral, coastal sage chaparral scrub, non-native and native grasslands, alluvial fan sage scrub, and sycamore-willow riparian woodland.

Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.*Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA are given below.

Coastal Sage Chaparral Scrub Communities:Consist of drought-deciduous, low, soft-leaved shrubs and herbs on gentle to steep slopes below 5,000 feet in elevation.Several dominant species may occur within scrub communities, with some areas overwhelmingly dominated by one or two species.Dominant species include California sagebrush (*Artemisia tridentata*), California buckwheat (*Eriogonum fasciculatum*), California brittle bush (*Encelia californica*), purple sage (*Salvia leucophylla*), and deerweed (*Acmispon glaber*).Coastal sage chaparral scrub is found at the lower elevations within the SEA on drier south-facing slopes, but can also be found on the north-facing slopes and canyons.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Dendromecon rigida* (bush poppy scrub) Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance

- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Ericameria linearifolia* (narrowleaf goldenbush scrub) Provisional Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub) Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub) Shrubland Alliance

Alluvial Fan Scrub:Consists of a mixture of shrubs that colonize sandy-gravelly flood deposited soils within intermittent creeks, arroyos, and drier terraces in large washes. Dominant species include California buckwheat (*Eriogonum fasciculatum*), scalebroom (*Lepidospartum squamatum*), quail bush (*Atriplex lentiformis*), and white sage (*Salvia apiana*).

Corresponding MCV communities:

- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub)Shrubland Alliance
- *Lepidospartum squamatum* (scale broom scrub)Shrubland Alliance
- *Malosma laurina* (laurel sumac scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub) Shrubland Alliance

Coast Live Oak Woodlands:Commonly occur along drainages that experience at least a seasonal flow or in other areas under mesic conditions.Soil structure and soil moisture are the most important factors for the survival of oak woodlands; soils must be deep, uncompacted, fertile, well-aerated, and well-drained.This community is dominated by coast live oak (*Quercus agrifolia* var. *agrifolia*).If sufficient groundwater is present, western sycamore (*Platanus racemosa*), which is usually associated with riparian habitats, may also occur in the oak woodland.Oak woodlands occupy areas within the canyons and drainages of the SEA.

Corresponding MCV community:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance

Coast Live Oak Riparian Forest:A variation of coast live oak woodland, where the canopy is moreclosely grown, and the trees occur in narrower formations along watercourses.Willow, California bay (*Umbellularia californica*), mulefat (*Baccharis salicifolia*), and other riparian species often occur in the understory.

Corresponding MCV community:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance

Sycamore-Willow Riparian Woodland:May include the following:western sycamore (*Platanus racemosa*), black willow (*Salix gooddingii*), arroyo willow (*Salix lasiolepis*), skunkbush (*Rhus*

aromatica), and California blackberry (*Rubus ursinus*).

Corresponding MCV Community:

- *Platanus racemosa* (California sycamore woodland) Woodland Alliance

Grassland Communities:Consist of low, herbaceous vegetation that is dominated by grasses, but generally also harbors native forbs and bulbs, as well as naturalized annual forbs.Topographic factors that contribute to grassland presence include gradual slopes or flat areas with deep, well-developed soils in areas below 3,000 feet.The species richness of grassland communities is dependent upon a number of land use factors, including intensity and duration of natural or anthropogenic disturbances, such as grazing.

Native grassland is often associated with coastal sage chaparral scrub and is found in pockets in close proximity to coastal sage chaparral scrub and non-native grassland.This community consists of at least 10 percent relative cover of native herbaceous plants (grasses and forbs).The remaining vegetative cover is made up of non-native grasses found in annual grassland and a variety of annual, showy flowers such as golden stars (*Bloomeria crocea*) and blue-eyed grass (*Sisyrinchium bellum*).Native grassland may be found scattered throughout the SEA, mostly in openings in coastal sage chaparral scrub and mixed with non-native grasslands.

Corresponding MCV communities:

- *Leymus condensatus* (giant wild rye grassland) Herbaceous Alliance
- *Nassella* [*Stipa*] *cernua* (nodding needle grass grassland) Provisional Herbaceous Alliance
- *Nassella* [*Stipa*] *lepida* (foothill needle grass grassland) Provisional Herbaceous Alliance
- *Nassella* [*Stipa*] *pulchra* (purple needle grass grassland) Herbaceous Alliance

Non-native grassland consists of dominant invasive annual grasses that are primarily of Mediterranean origin.Dominant species found within this community include slender wild oat (*Avena barbata*), wild oat (*Avena fatua*) ripgut brome (*Bromus diandrus*), and red brome (*Bromus madritensis* ssp*. rubens*).

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*)(wild oats grasslands) Semi-Natural Herbaceous Stands
- *Brassica* (*nigra*) and other mustards (upland mustards) Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus*, *hordeaceus*)-*Brachypodium distachyon* (annual brome grasslands)Semi-Natural Herbaceous Stands
- *Bromus rubens-Schismus* (*arabicus*, *barbatus*)([*Bromus madritensis* ssp*. rubens*] red brome or Mediterranean grass grasslands) Semi-Natural Herbaceous Stands
- *Centaurea* (*solstitialis*, *melitensis*) (yellow star-thistle fields)Semi-Natural Herbaceous Stands

- *Lolium perenne* [*Festuca perennis*](perennial rye grass fields) Semi-Natural Herbaceous Stands

Wildlife

The SEA provides for extremely diverse and abundant wildlife, commensurate with extensive acreages of natural open space and great diversity of habitat types, within the stream channels and on the surrounding uplands.While a few wildlife species may be entirely dependent upon or obligate within a single vegetative community, the mosaic of vegetation communities within the area and adjoining uplands constitutes a continuum of functional ecosystems.These ecosystems support a wide variety of wildlife species, within the SEA boundaries and as a part of the regional ecosystem.

Analysis of invertebrates on any given site generally is limited by a lack of specific data, but the size of the SEA and diversity of habitats present are considered sufficient to support healthy populations of a very large number of invertebrate species.The riparian formations and aquatic habitats within the SEA support diverse faunas of arthropods, which may include native fairy shrimp, craneflies, blackflies and other aquatic dipterans, stoneflies, caddisflies, and dobsonflies, water boatmen, giant water bugs, ground beetles, diving beetles, and tiger beetles.Terrestrial insects are abundant around riparian corridors and in scrub habitats, particularly in oak-dominated habitats.

Amphibians are abundant and relatively diverse within moister woodland areas, along montane canyon bottoms, in riparian areas, and within surface water features.The overall riparian systems of the SEA provide habitat for a number of frog and toad populations, which may include populations of Baja California chorus frog (*Pseudacris hypochondriaca*) and California chorus frog (*P. cadaverina*), California toad (*Anaxyrus halophilus*), and western spadefoot (*Spea hammondii*), as well as the federally-endangered arroyo toad (*Anaxyrus californicus*). The federally-threatened California red-legged frog (*Rana draytonii*) has a known population and critical habitat in Michael Creek to the north. This frog could occur in Lake Piru and during times of very high water in the SEA. Open scrub, chaparral and alluvial fan habitats support diverse reptile populations, and the overall herpetofauna of the SEA would encompass numerous lizard species as well as a robust snake fauna.

Bird diversity within the SEA is related to habitat opportunities for year-round residents, seasonal residents, migrating raptors, and song birds.Coastal sage chaparral scrub and chaparral host a suite of birds typical of such sites at lower elevations over most of the coastal slopes of Southern California.The most productive sites for resident coastal sage chaparral scrub and chaparral birds are around riparian and freshwater systems, which also attract large numbers of migrants during the spring and fall.Oak woodlands and riparian areas generally support many more species.Notable species include the summer tanager (*Piranga rubra*), Bullock's oriole (*Icterus bullockii*), black-headed grosbeak (*Pheucticus melanocephalus*), band-tailed pigeon (*Patagioenas fasciata*), western wood-pewee (*Contopus sordidulus*), several swallow species, western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), willow flycatcher (*Empidonax traillii*), least Bell's vireo (*Vireo bellii pusillus*), and the California condor (*Gymnogyps californianus*).

Native mammal diversity within the SEA is considerable.These likely include bats, rodents, squirrels, rabbits, moles, weasels, American badger (*Taxidea taxus*), skunks, raccoon (*Procyon lotor*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), mountain lion (*Puma concolor*), and mule deer (*Odocoileus hemionus*).

Wildlife Movement

The SEA provides riparian corridors, which serve as linkages between the Pacific coastline, coastranges, interior ranges, the high desert and southern Sierras (via the Tehachapi Range).Animals move through the Santa Felicia watershed along and within the riparian systems between Piru Lake in Ventura County and the San Gabriel Mountain range and beyond.The tributary drainages in this SEA appear fully intact and open and support regional movement by many wildlife species.Most of the SEA was designated as an important wildlife movement linkage—Sierra Madre-Castaic Connection—which was outlined by the South Coast Wildlands study of linkages (Penrod, *et al*. 2005).

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, or otherwise rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas."Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species.

Sensitive Plan Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.These communities include chamise-white sage chaparral, holly leaf cherry chaparral, California brittle bush scrub, narrowleaf goldenbush scrub, scale broom scrub, white sage scrub, California sycamore woodland, giant wild rye grassland, nodding needle grass grassland, foothill needle grass grassland, and purple needle grass grassland, which occur throughout the SEA.

Sensitive Plant Species

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Braunton's milk-vetch (*Astragalus brauntonii*)FE, RPR 1B.1
- Nevin's barberry (*Berberis nevinii*)FE, SE, RPR 1B.1
- Round-leaved filaree (*California macrophylla*)RPR 1B.1
- Peirson's morning-glory (*Calystegia peirsonii*)RPR 4.2
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)FC, SE, RPR 1B.1

- Slender-horned spineflower (*Dodecahema leptoceras*)FE, SE, RPR 1B.1
- Palmer's grapplinghook (*Harpagonella palmeri*)RPR 4.2
- Newhall sunflower (*Helianthus inexpectatus*)RPR 1B.1
- Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*)RPR 1A
- Davidson's bushmallow (*Malacothamnus davidsonii*)RPR 1B.2
- Ojai navarretia (*Navarretia ojaiensis*)RPR 1B.1
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*)RPR 2.2
- Chaparral ragwort (*Senecio aphanactis*)RPR 2.2
- Greata's aster (*Symphyotrichum greatae*)RPR 1B.3
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)RPR 1B.2
- Late-flowered mariposa lily (*Calochortus fimbriatus*)RPR 1B.2
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2
- California Orcutt grass (*Orcuttia californica*)RPR FE, SE, 1B.1

Sensitive Animal Species

The following vertebrate species are state and/or federally-listed as endangered or threatened, and are known to have occurred within the SEA or have potential to occur in the SEA:

- Riverside fairy shrimp (*Streptocephalus woottoni*)FE
- Cuckoo wasp [no common name] (*Ceratochrysis longimala*)~~CDFG~~CDFW Special Animals List
- Arroyo toad (*Anaxyrus californicus*)FE, SSC
- California red-legged frog (*Rana draytonii*)FT, SSC
- Western spadefoot (*Spea hammondii*)BLMS, SSC
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- Western pond turtle (*Emys marmorata*)BLMS, FSS, SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Coast patch-nosed snake (*Salvadora hexalepis virgultea*)SSC
- Two-striped garter snake (*Thamnophis hammondii*)BLMS, FSS, SSC

- Cooper's hawk (*Accipiter cooperii*)~~CDFG~~CDFW Watch List
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Grasshopper sparrow (*Ammodramus savannarum*)~~CDFG~~CDFW Special Animals List
- Bell's sage sparrow (*Amphispiza belli belli*)BCC, ~~CDFG~~CDFW Watch List
- Burrowing owl (*Athene cunicularia*)BCC, BLMS, SSC
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)FC, BCC, FSS, SE
- Yellow warbler (*Dendroica petechia brewsteri*)SSC
- White-tailed kite (*Elanus leucurus*)~~CDFG~~CDFW Fully Protected
- California horned lark (*Eremophila alpestris actia*)~~CDFG~~CDFW Watch List, LAA
- Prairie falcon (*Falco mexicanus*)BCC, ~~CDFG~~CDFW Watch List, LAA
- California condor (*Gymnogyps californianus*)FE, SE, CDF, ~~CDFG~~CDFW Fully Protected, USBC, AWL, ABC
- Yellow-breasted chat (*Icteria virens*)SSC
- Loggerhead shrike (*Lanius ludovicianus*)BCC, SSC, LAA
- Coastal California gnatcatcher (*Polioptila californica californica*)FT, SSC, USBC, AWL, ABC
- Least Bell's vireo (*Vireo bellii pusillus*)FE, BCC, SE, USBC, AWL, ABC
- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Spotted bat (*Euderma maculatum*)BLMS, SSC, WBWG High
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)SSC
- California leaf-nosed bat (*Macrotus californicus*)FSS, SSC, WBWG High
- San Diego desert woodrat (*Neotoma lepida intermedia*)SSC
- American badger (*Taxidea taxus*)SSC

CRITERIA ANALYSIS OF THESANTA FELICIA SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Not Met	The SEA does not include known core habitat.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The natural mountainous terrain and vegetation habitats of theSEA, which is a coastal drainage, have been diminished elsewhere within Southern California through development.The SEA encompasses a fine example of vegetation that has not been impacted very much by development.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	This is a somewhat remote area where natural flora and natural bottoms remain in the canyons, invasive predators are nonexistent, and human intrusion is minimal, which is a rare habitat in the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The SEA encompasses important tributaries (Santa Felicia Canyon and Devil Canyon) of Piru Creek.Piru Creek is the major tributary of the Santa Clara River.Nearly all of the drainages within the SEA are natural with sensitive habitats of all kinds of riparian forest.These drainages are all migratory corridors for both plants and animals that connect the San Gabriel Mountains with the Santa Clara River and the coast, the Sierra Madre-Castaic Connection.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Not Met	The Santa Felicia watershed is not known as a physical/geographical extreme habitat.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The Santa Felicia watershed is an excellent example ofthe inland watercourses and their vegetation on the coastal side of the Transverse Ranges.It is largely undisturbed, and a number of the drainages are still perennial.

In conclusion, the area is an SEA because it contains: B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, and migrating grounds, which are limited in availability in the County; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Santa Monica Mountains SEA

Location

General

The Santa Monica Mountains Significant Ecological Area (SEA) is located within the Santa Monica Mountains in a mostly unincorporated area of the County.Much of the area is in the Santa Monica Mountains National Recreation Area, but is privately owned.Many of the federal lands under the jurisdiction of the National Park Service (NPS) are included in the SEA designation. Many of the state parklands, notably Malibu Creek State Park and Topanga State Park, are also included in the SEA.The SEA includes nearly all of the canyons and ridges from the Ventura-Los Angeles Countyline,and east to Sullivan Canyon, which is near the communities of Pacific Palisades Brentwood to the south, and Encino to the north.From south to north, the SEA extends from the Pacific Ocean shoreline or urban-wildland interface of Malibu, through the unincorporated area of the Santa Monica Mountains proper, to the northern edge of the SEA extending along the undeveloped southern edge of the San Fernando Valley or irregularly along the Ventura-Los Angeles County line. It should be stated that this SEA recognizes the rare habitat of a small regional mountain range with a high diversity of topography and moisture regimes, and with vegetation adapted to a Mediterranean climate, which is globally rare, existing elsewhere only along western portions of continents at 30-40° latitude[1].Although the habitats may seem common within the Santa Monica Mountains, in terms of limited indigenous global ranges of the constituent species, their special adaptations to climate, the relatively intact character of the habitats, and the plant assemblage of the Santa Monica Mountains are unique.Development within the SEA that extends the nearby expansive urban development of the Los Angeles Basin and San Fernando Valley needs to be carefully considered to preserve these special resources.

The SEA is located at least partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles:Thousand Oaks, Calabasas, Canoga Park, Triunfo Pass, Point Dume, Malibu, and Topanga.

General Boundary and Resources Description

Within the SEA boundary, there are a number of areas that are not a part of the SEA due to dense development.For example, La Sierra, Malibu Lake, and most of the City of Malibu have been excluded.

The majority of the SEA lies within the unincorporated area of the County.Other jurisdictions include the City of Malibu, the City of Los Angeles, City of Calabasas, the City of Agoura Hills, the City of

[1] Six regions on Earth have a coastal climate where ocean currents mediate an equable climate yet cause most precipitation to occur outside the summer period of most intense sunlight and most vegetative growth for many plants.These are California, the MediterraneanBasin, portions of South Australia, South Africa, and Chile

Hidden Hills, and the City of Westlake Village.

From the Ventura-Los Angeles County line to the vicinity of Topanga Beach, the southern boundary of the SEA irregularly contacts the boundary of the Malibu Coastline CRA, which extends offshore about a 0.8 mile to capture the kelp beds and rich natural marine communities of and off the coastline of the Santa Monica Mountains.The sandy beaches along this SEA are the least disturbed beaches of the County, some of them completely natural.This is a remnant of the typical rock and sand shoreline that once occurred along the coast of Southern California.From Mugu Lagoon to Latigo Point (the County portion starting at the Ventura-Los Angeles County line and Leo Carillo State Beach), this is an ASBS (Area of Special Biological Significance), which is a marine area designated by the State Water Resources Control Board as having exceptionally good water quality and natural community features.Populated and disturbed areas along the shore are not included in the SEA.

Beginning at the intersection of the Ventura-Los Angeles County line and State Route-1, the southern area of the SEA includes all the terrestrial area of Leo Carrillo State Beach (a state park that has much beautiful upland acreage of grasslands, coastal chaparral, and an excellent riparian area of sycamore-oak forest along the Arroyo Sequit).The Arroyo Sequit from the coast to the junction of West and East forks and about a 0.5 mile of the West Fork are federally-designated critical habitat for the southern steelhead (*Oncorhynchus mykiss irideus*), which is a salmon that runs upstream for breeding, but spends most of its life in the ocean.The young fish, however, spend the first year of life in fresh water.

At the eastern boundary of Leo Carillo State Beach, an unnamed canyon is excluded from the SEA, but San Nicolas Canyon with its riparian woodland is included all the way to the shore.Urban areas to the east of San Nicolas Canyon are also excluded. The Los Alisos and Lechuza Canyon immediate drainages are included up to the highway.From Lechuza Canyon, the excluded area extends north to the southern border of Charmlee Natural Area (a County park supporting grasslands and chaparral).Much of the Encinal Canyon drainage is included in the SEA north of State Route-1, and the Steep Hill Canyon drainage is included north of State Route-1.Trancas Canyon is densely settled in the area near the coastline; only the steeper, natural section is included in the SEA. To the east, a large excluded area encompasses the dense habitation of the Malibu Riviera.

The SEA includes the riparian forest of Zuma Canyon as it exits onto the coastal plain, with a small sub-watershed designated critical habitat for the federally-endangered Braunton's milkvetch (*Astragalus brauntonii*).This rare plant is narrowly endemic to four mountain ranges of Southern California that have a particular marine-originated rock stratum of interbedded carbonates and sandstones.The SEA also includes portions of the riparian forest of Ramirez Canyon, where it has not been impacted by development in the Malibu Riviera.The natural area of Escondido Canyon and its 150feet waterfall is included.Latigo Canyon is included north of State Route-1, where chaparral intergrades with walnut and oak woodlands along the drainages and north-facing slopes.East of Latigo Canyon, the boundary of the excluded area follows the ridges immediately north of State Route-1 to join the highway west of Solstice Canyon. Solstice Canyon and its County Park are included in the SEA. These support grasslands, chaparral, and a fine riparian area of sycamore-oak forest along Solstice Canyon.Puerco and Marie Canyon drainages are included north of State Route-1.

In the vicinity of Winter Canyon, the boundary follows Malibu Canyon Road to exclude the central community area of Malibu in another large island.A finger of the SEA extends through central Malibu along Malibu Creek in the area of Malibu Creek State Park and Malibu Lagoon State Beach to include the Creek and Malibu Lagoon south of Pacific Coast Highway.This is one of the points of contact between the Santa Monica Mountains SEA and the Malibu Coastline CRA.Malibu Creek from the shore to its major bend to the west in Malibu Canyon is federally-designated critical habitat for the southern steelhead.Coincident with the steelhead critical habitat along Malibu Creek and all brackish portions of the Malibu Lagoon are designated critical habitat for the endangered tidewater goby (*Eucyclogobius newberryi*).This little two-inch fish was once common in brackish water of coastal lagoons of streams the length of the State of California.This pristine habitat is disappearing (the fish is apparently gone from San Francisco Bay), and any location where the tidewater goby is still found is a unique place.

The Malibu Lagoon is the only remaining intact coastal lagoon in the County[2], and still has its perennial stream to maintain the brackish conditions that are essential to the diverse and unique group of species of coastal lagoons. The federally-endangered southern steelhead passes through this lagoon on its upstream and downstream spawning runs, and its young fish (smolts) may spend some time in the lagoon before entering their oceanic habitat. The passage is critical habitat for the steelhead, as well as for the endangered tidewater goby (*Eucyclogobius newberryi*). This lagoon has one of the County's three [3] remaining saltmarshes, with dominant species of pickleweeds (*Arthrocnemum subterminale* and *Salicornia pacifica*). The Malibu Lagoon supports a good representation of coastal strand community (now groomed off many of the recreational beaches), is a resting stop on the Pacific Flyway (over 200 species of birds reported), and has many resident avian species. From fall to spring, it supports a flock of the federally-threatened western snowy plover (*Charadrius alexandrinus nivosus*), and there are recent indications that some may over-summer to breed (after a hiatus in breeding of many decades, Ryan Ecological Consulting, 2010). The pickleweed is valuable non-breeding habitat for the state-endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*).

East of central Malibu, the excluded area borders primarily follow the less-inhabited ridges that border Carbon and Las Flores canyons and about a 0.5 mile north of State Route-1.East of Las Flores Canyon, the border of the excluded area follows a transmission line to skirt an old oil field.At the western ridge of Piedra Gorda, the SEA boundary follows the ridgeline southeast to State Route-1.From Piedra Gorda, the SEA boundary closely tracks State Route-1 along the substantial sea cliffs, avoiding two small developed areas north of the highway near the mouths of Pena and Tuna canyons.The SEA includes all of the meandering Topanga Canyon Creek at Topanga Beach.Upstream nearly to the community of Fernwood, Topanga Canyon is federally-designated critical habitat for the southern steelhead.Near the shore in Topanga Canyon Creek is critical habitat for the tidewater goby. This is the eastern point of contact between the Malibu Coastline CRAand SEA.It is also at this point where the shoreline where there are no more excluded areas.

[2] Ballona Creek lagoon is also in Los AngelesCounty, but exists in a disturbed condition.

[3] The three areas with salt marsh in Los AngelesCounty are AlamitosBay, Ballona Lagoon, and Malibu Lagoon.

The SEA includes Parker Mesa, north of State Route-1, and is coterminous with the boundary for the City of Los Angeles towards the north.About one mile north of the coast, the boundary extends to the east, contouring around the ridgelines that border the populated areas of Santa Ynez, Pulga, and Temescal canyons, with some residential areas on the ridges excluded from the SEA.These three canyons contain riparian oak and sycamore forests, which are a good variety of canyon habitats that include rocky outcrops and small waterfalls, are preserved in their upper reaches by inclusion in the Topanga State Park. The upstream areas of Santa Ynez, Pulga, and Temescal canyons that are uphill from the community of Palisades Highlands include much of federally-designated critical habitat for the Braunton's milkvetch.The boundary skirts Will Rogers State Park, but includes much of the unpopulated part of Rustic Canyon.

At Rustic Canyon, the boundary follows the eastern ridge to the north.Tracing the edge of development along the eastern slope of the canyon, the boundary continues north and eventually crosses over the ridgeline and into the undeveloped part of Sullivan Canyon. The boundary then follows the eastern slope of Sullivan Canyon and continues north along the ridgeline between Sullivan Canyon and Mandeville Canyon.After crossing the main ridge of the coastal zone and Mulholland Drive near San Vicente Mountain, the SEA boundary reaches and includes the sub-watershed of Encino Reservoir.

On the west side of Encino Reservoir, the SEA boundary turns west and follows the edge of development on the northern slopes of the Santa Monica Mountains that form the southern border of the San Fernando Valley.Some development is excluded on the east side of Topanga Canyon and the Calabasas Highlands area.The upper reaches of Topanga Canyon are included, and the SEA crosses the ridge to include the upper slopes of a natural drainage that is opposite to Topanga Canyon on the San Fernando Valley side.

West of Calabasas Park, the SEA boundary extends northeast and contours along the upper slopes of McCoy Canyon to include a finger of SEA on the north ridge of McCoy Canyon, which is part of state park land. On the west side of Calabasas Park and Hidden Hills, the boundary crosses State Route-101 along the western edge of development in Hidden Hills north to the County line. The undeveloped portion of Gates Canyon within the Simi Hills and its watershed is included north to the Ventura-Los Angeles County line, excluding a ridgetop island and developed portions of the City of Calabasas.A narrow finger of connection joins the portion of the SEA east of the City of Calabasas to the area west of the City, north of State Route-101 along a tributary of Las Virgenes Creek.Las Virgenes is an important tributary of Malibu Creek, and although this area is not in the coastal zone, it represents a portion of the upper coastal watershed.Further to the west, the boundary extends north again to encompass the open space from Las Virgenes Road along the Ventura-Los Angeles County line to the edge of development within the City of Agoura Hills.Within this portion of the SEA, Cheseboro Canyon contains fine natural, undeveloped sections of canyon just east of the City of Agoura Hills that are administered by both the NPS and the State Park system. The SEA includes all of undeveloped Cheseboro Canyon and the undeveloped western ridge of Cheseboro's important tributary, Palo Comado Canyon.This is the western terminus of the SEA that lies north of State Route-101.

An important feature of this area is a small tributary of Las Virgenes Creek (and ultimately Malibu Creek) named Liberty Canyon. The underpass of State Route-101 at Liberty Canyon Road along the drainage conveys relatively less vehicular traffic than other freeway crossings within several miles, and is one of the few active wildlife passage areas along the entire extent of State Route-101

through the Santa Monica Mountains. All other watercourse and street crossings of State Route-101 are very constrained or else entirely impassible for wildlife. There are widely documented concerns for the consequences of genetic isolation for the small band of mountain lions (*Puma concolor*) of the Santa Monica Mountains. Mountain lions that are known to use this area of the SEA to transit back and forth between the Santa Monica Mountains and the greater lion populations of the Simi Hills and north. The area north of the Liberty Canyon underpass is natural chaparral, watercourses, and grassland administered by the Santa Monica Mountains Conservancy. South of State Route-101, development is present with a very narrow corridor of natural habitat that includes valley oak (*Quercus lobata*) along the creek of Liberty Canyon.

A small island of developed area south of State Route-101 and along Liberty Canyon is excluded from the SEA. From the Liberty Canyon underpass south of State Route-101 the SEA boundary follows the north-facing side of an unnamed ridge at the southern end of the City of Agoura Hills towards the northern slopes of Ladyface Mountain.This is a chaparral-dominated area with numerous canyons and ridges supporting federally-threatened Agoura Hills dudleya(*Dudleya cymosa* ssp. *agourensis*), and one of the nine critical habitat areas in the County of Los Angeles and in theSEA for the state- and federally-endangered Lyon's pentachaeta (*Pentachaeta lyonii*), as well as other uncommon and rare plants, such as Fish's milkwort (*Polygala cornuta* var. *fishiae*), Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*), and the southern-most known occurrence of the California juniper (*Juniperus californica*) within the County.The SEA northern boundary crosses Kanan Dume Road in the area where Lindero Canyon formerly joined Medea Creek and continues its contour along the north-facing ridge of Ladyface Mountain, which also supports Agoura Hills dudleya, Lyon's pentachaeta, Ojai navarretia (*Navarretia ojaiensis*), and other rare and sensitive plants on its chaparral-covered slopes.A small area with development and fill along the south side of Kanan Dume Road has been excluded from the SEA.

The SEA boundary veers to the southwest to avoid the developed areas of Westlake Village, but includes Las Virgenes Reservoir in the SEA and three more of the critical habitat areas for the Lyon's pentachaeta. A finger includes an undeveloped section of Triunfo Canyon. A short distance southwest of Las Virgenes Reservoir, the boundary crosses Decker Canyon road and extends west to the Ventura-Los Angeles County line, which is another area of critical habitat for the Lyon's pentachaeta. Most of the critical habitat areas for Lyon's pentachaeta in the County are covered by the North Area Plan regulations for the Santa Monica Mountains, but some critical habitat areas also occur in the coastal zone. The boundary then follows the Ventura-Los Angeles County line to the southwest all the way to the coast and State Route-1 where the northern and the southern boundary join at Leo Carillo State Beach.

Vegetation

The SEA includes most of the Santa Monica Mountains range.This east-west trending range is geologically complex, and because of its unique geological history and rugged topography with many microhabitats, it has a flora that is unlike any other place in the County.There are about 900 species of vascular plants—an exceptionally diverse flora for an area of its size. (Raven et al., 1986) The County portion of the Santa Monica Mountains are characterized by steep, rugged terrain of mountain slopes and canyons, with elevations ranging from sea level to over 2,800 feet above mean sea level (MSL) at Castro Peak.The Santa Monica Mountains are bounded by the Pacific Ocean to the south, the Oxnard Plain to the west, the Los Angeles Basin to the east, and the San Fernando Valley and Simi Hills on the north.The SEA includes numerous minor and major canyons.Named

canyons include Trancas Canyon, Zuma Canyon, Ramirez Canyon, Escondido Canyon, Solstice Canyon, Corral Canyon, Malibu Canyon, Carbon Canyon, Los Flores Canyon, Tuna Canyon, Topanga Canyon, Santa Ynez Canyon, Temescal Canyon, Sullivan Canyon, Lobo Canyon, Triunfo Canyon, Las Virgenes Canyon, Liberty Canyon, Palo Comado Canyon, and Stokes Canyon.Major drainages within the SEA include the Arroyo Sequit, Zuma Canyon Creek, Malibu Creek, Los Flores Canyon Creek, Topanga Canyon Creek, Triunfo Creek, Las Virgenes Creek, and Medea Creek.

These drainages all support well-developed riparian communities, which are a type of sensitive and rare community that is essential to the biodiversity of the County.Natural watercourses provide water, food and cover for a variety of animal species and provide an ecological link between the upland and marine environments. Additionally, they contribute to regional and continental connectivity by providing shelter and forage for many migratory bird species, which maintains biodiversity over several spatial scales.Many riparian corridors within the SEA contain perennial sections that are among the last remaining major drainages in the Santa Monica Mountains in an undeveloped condition.In the canyon bottoms are riparian forests, which are sensitive habitats because of their rarity and loss to channelization and development.Most riparian forests in the Santa Monica Mountains are of western sycamore (*Platanus racemosa*) and coast live oak (*Quercus agrifolia* var. *agrifolia*), Fremont and black cottonwood (*Populus fremontii* ssp. *fremontii* and *P. trichocarpa*) and leatherleaf ash (*Fraxinus velutina*). The upstream and upper canyon ridges are dry and support coastal sage scrub, which blends with the more mesic chaparral of the lower slopes.The rich riparian community of plants supports abundant wildlife populations that include amphibians and birds dependent on surface moisture, and mule deer and mountain lion, the latter of which is an indicator of large-scale ecosystem health.

The endangered Lyon's pentachaeta (*Pentachaeta lyonii*) prefers compact, undisturbed soil on the upper coastal slope areas of many of these streams. Because such areas are often flat and may be cleared of other plants, this puts the plant in the path of development. This "daisy" is a narrow endemic of Los Angeles and Ventura counties, and has recently lost about half of its known population.Most of the critical habitat for Lyon's pentachaeta occurs in the northern area of the SEA.At the south end of the artificial Malibu Lake on Triunfo Creek, in the rolling slope area of Medea Creek that is south of the City of Agoura Hills, near the confluences of Lobo and Triunfo creeks and La Sierra Canyon and Triunfo Creek, on the east and west ridgelines of Las Virgenes Reservoir extending to the drainage junction with Triunfo Creek along Decker Road to the ridgeline area of Mulholland Highway, and in the area of Saddle Rock on the Mulholland Highway.These are about half of the areas of critical habitat named for the plant. The remainder are in nearby Ventura County extending between the Santa Susana Mountains in the north, and the Santa Monica Mountains in this area.

Because of the undisturbed conditions, with riparian forests filtering and cooling the waters, Arroyo Sequit, Malibu Creek, and Topanga Canyon still support extremely rare spawning runs of the federally-endangered southern steelhead.Historically, steelhead was known from Solstice andZuma canyons as well, and it is likely that all the major drainages, which once had perennial water and extended to the shore in the rainy season supported this species.

The majority of the SEA consists of undisturbed open space with scattered rural residential communities and a few high-density residential developments.Open space within the SEA is mostly vegetated with dense stands of chaparral.Other types of vegetation, such as woodlands and

grasslands, occur in smaller portions scattered throughout the SEA on moist or north facing slopes and canyon bottoms.Lesser amounts of coastal sage scrub are also present, primarily on low-elevation, dry south-facing slopes, ridgelines, or as early successional communities in previously disturbed areas.

Topanga Canyon State Park and Malibu Creek State Park have pristine areas of all the characteristic habitats of the Santa Monica Mountains: chaparral, oak woodland, grasslands, and coastal sage scrub.Some of the principally-named canyons of Malibu Creek State Park with diverse riparian habitat on north-facing slopes include Fern, Mendenhall, and Lost Cabin canyons.The headwaters of the major drainages of the Santa Monica Mountains often lie outside park jurisdictions, but most retain intact natural communities that contribute to a clean water source.Many of these with scattered development are included in the SEA.

The perennial stream of Cold Creek lies in the center of a relatively undisturbed natural sandstone basin that has a diversity of flora reflecting the extreme range in physical conditions of the watershed, from cool wet streambed to hot dry rocky ridges, making the area a remarkable concentration of native vegetative diversity.Pristine stands of chaparral, southern oak woodland, coastal sage scrub, and riparian woodland all support the unusual species found in the streamside areas such as stream orchid (*Epipactis gigantea*), scarlet monkeyflower (*Mimulus cardinalis*), ocellated Humboldt lily (*Lilium humboldtii* var. *ocellatum*), big-leaf maple (*Acer macrophyllum*), and redshank (*Adenostoma sparsifolium*). Redshank has a widely disjunct distribution, with scattered populations from San Diego to Santa Barbara County. Redshank is common in the southern portion of the Cold Creek watershed, but this population and another within Decker and Encinal canyons represent two of the few localities of this species within the County.Flowering ash (*Fraxinus dipetala*), usually a diminutive tree of 15-20 feet, can grow to 40 feet here.This diversity supports good populations of stream animals: turtles, lizards, snakes, and amphibians.There are a number of private reserves and study facilities in the watershed, including a university field station.Pierce College has a collection of the plants in its herbarium and also an insect collection for the Cold Creek area.

Where drainage conditions result in moist sandstone and micro-slumping of developing soil, this creates a variety of habitats in close proximity to one another.There can be very unusual associations of species—xerophytic chaparral yucca (*Yucca whipplei*) and lance-leaf live-forevernext to a diverse array of moisture-dependent ferns, mosses, liverworts, and hornworts.A north-east draining tributary of Las Flores called “Hepatic Gulch,” with a cirrhotic sandstone rock formation, has an unusual assemblage of uncommon plants and a good diversity of wildflowers.Adjacent to seasonally mesic moss-dominated areas supporting California saxifrage (*Micranthes californica*) are silver birds-foot trefoil (*Acmispon argophyllus* var. *argophyllus*), Wright’s buckwheat (*Eriogonum wrightii* var. *membranaceum*), wooly paintbrush (*Castilleja foliolosa*), redskin onion (*Allium haematochiton*), and mariposa lilies (*Calochortus* spp).

Tuna and Pena canyons are the last coast drainages of the central Santa Monica Mountains that have not had development in the watershed or between the canyon mouth and the coast.Tuna Canyon has a perennial stream.Due to the coastal exposure, the riparian woodlands in the canyon bottoms are in excellent health and support healthy wildlife populations.The extensive coast live oak woodland in the riparian area is known to support over 300 species of various plants and animals.Animals utilize the stream as a water source and forage in the chaparral and coastal sage scrub on adjacent hillsides.These areas are important to migratory songbird and waterfowl species.

Temescal, Rustic, and Sullivan canyons are excellent representatives of the dry chaparral and coastal sage scrub plant communities found in the interior canyons of the Santa Monica Mountains.The canyons are less steep than others and their open form favors vegetation with less understory growth, which provides great examples of lush intermittent stream courses.They each have hiking trails and a drier canyon flora, even within stream beds.To the east is the dense urban habitat of the City of Los Angeles.Wildlife use these canyons as linkage and movement corridors, which connect the coastal populations and those of the interior valleys.

Encino Reservoir has the best undisturbed stand of inland chaparral, coastal sage scrub and streamside vegetation remaining on the inland slope of the Santa Monica Mountains.Inland chaparral develops where the moist coastal air rarely intrudes, and its characteristic species composition is different from similar communities on the coastal side of the mountains. In addition, the freshwater habitat is present along the shores of the Reservoir, so that the overlap of habitats provides a greater number of resources than each habitat would have alone.

The sections of Las Virgenes Canyon and Medea Creek within the SEA support exceptionally diverse wildflower populations, and if rainfall patterns are propitious, wildflower fields may cover large sections of the Canyon slopes.The surrounding canyon slopes support lush growth of coastal sage scrub and other chaparral.The Canyon itself has some floral elements that are characteristic of interior or even desert conditions: the California juniper (*Juniperus californica*) is found only in the Santa Monica Mountains, and narrowleaf goldenbush (*Ericameria linearifolia*) is another interior plant that is common in this canyon and rare elsewhere in the SEA.A variety of live-forever (*Dudleya* spp.), species are present on the canyon walls and rock outcrops, including chalk lettuce (*D. farinosa*), lance-leaf live-forever (*D. lanceolata*), and federally-threatened Agoura Hills dudleya (*D. cymosa* ssp. *agourensis*).One ofthe critical habitat areas for Lyon’s pentachaeta is in this section of the SEA.

South of Liberty Canyon is La Sierra Canyon, which is an important tributary of Triunfo Creek, with exceptional floral biodiversity.La Sierra Canyon has a flora that includes elements found in only a few known places in the Santa Monica Mountains.Some of these are the rare state and federally-endangered Santa Monica Mountainslive-forever (*Dudleya cymosa* ssp. *marcescens*); the creek dogwood (*Cornus glabrata,* known only from one other site in the Santa Monicas); the giant chain fern (*Woodwardia fimbriata*, which is exceptionally large in this locality); ocellated Humboldt lily (*Lilium humboldtii* ssp. *ocellatum*, which is also very tall in this locality), and dense stands of big-leaf maple (*Acer macrophyllum*,which isone of the uncommon, large-leaved, deciduous trees of Southern California that is an obligate of moist stream habitat); dense stands of coast live oak (*Quercus agrifolia* var. *agrifolia*, protected by County ordinance and an oak woodland management plan); and very rare anywhere in the County, dense streamside stands of California bay (*Umbellularia californica*).

Palo Comado Canyon is one of the remaining areas with the emblematic California habitat of mixed southern oak woodland and savannah on rolling grassy hills.This type of habitat was one of the first to disappear with of the arrival of Europeansettlers and the use of water diversions for the irrigation of crops.Agriculture made way for dense urban development, and very little of the oak savannah that was typical of Southern California ranchos remain.What was left was heavily impacted by cattle grazing.Along with facilitating non-native grasses that have displaced the native fields of wildflowers, cattle often consume the oak seedlings that would otherwise have replaced oaks that succumb to old age, which converts the woodlands into grasslands.Trees in Palo Comado Canyon support

abundant populations of raptors, woodpeckers, western gray squirrels, quail and other savannah species.The ridgelines around the canyons support coastal sage scrub and other kinds of chaparral.The savannah, canyons, and ridgetop chaparral combine to support the connectivity that wildlife and plant populations need to sustain themselves, and this area has been named in a number of studies as very important to the continued genetic exchange and population replenishment of the County and other parts of Southern California.

Vegetation within the SEA is comprised of a large variety of community types. The diversity of the communities reflects the topography of the Santa Monica Mountains. The southern slopes are strongly affected by moist marine weather, while the northern slopes are influenced by drier inland weather conditions.In addition, the steepness of many slopes causes sharp differences in vegetation on either side of the ridges.All plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEAs*.Sensitive plant species and plant communities occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA, including chaparral, redshank chaparral, coastal sage scrub, non-native grassland, native grassland, walnut woodland, valley oak woodland, coast live oak woodland, southern willow scrub, cottonwood-willow riparian forest, oak riparian forest, salt marsh, sycamore-alder woodland, freshwater marsh, and disturbed communities are presented below.

Chaparral:Consists of broad-leafed or needle-leafed, sclerophyllous (hard-leafed), medium height to tall shrubs that form a dense cover on steep slopes below 5,000 feet in Southern California.Dominant species found within this community include ceanothus, toyon, scrub oak, sugar bush, holly-leaved cherry, hollyleaf redberry, chamise, laurel sumac, and manzanita.This plant community occurs throughout the SEA and occupies most of the higher elevations and steep slopes.

Corresponding MCV communities:

- Adenostoma fasciculatum (chamise chaparral) Shrubland Alliance
- *Adenostoma fasciculatum-Salvia apiana* (chamise-white sage chaparral) Shrubland Alliance
- *Arctostaphylos glandulosa* (Eastwood's manzanita chaparral) Shrubland Alliance
- *Arctostaphylos glauca* (bigberry manzanita chaparral) Shrubland Alliance
- *Ceanothus megacarpus* (big pod ceanothus chaparral)Shrubland Alliance
- *Ceanothus spinosus* (greenbark ceanothus chaparral) Shrubland Alliance
- *Ceanothus oliganthus* (hairy leaf ceanothus chaparral) Shrubland Alliance
- *Prunus ilicifolia* (holly leaf cherry chaparral) Shrubland Alliance
- *Rhus ovata* (sugarbush chaparral)Shrubland Alliance

Redshank Chaparral:A very similar community to the chaparral described above, with the exception

that red shank is the dominant species with lesser amounts of other chaparral species.This community is less common.It occurs in small patches, on steep slopes throughout the SEA.

Corresponding MCV communities:

- *Adenostoma sparsifolium* (redshank chaparral)Shrubland Alliance

Coastal Sage Scrub:Consists of drought-deciduous, low, soft-leafed shrubs and herbs on gentle to steep slopes under 1,500 feet in elevation.This community is dominated by California sagebrush, California buckwheat, black sage, purple sage, and California encelia.Coastal sage scrub is distributed throughout the SEA along dry ridgelines, slopes, and other areas previously disturbed by fire.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Dendromecon rigida* (bush poppy scrub) Shrubland Alliance
- *Diplacus aurantiacus* (bush monkeyflower scrub)Shrubland Alliance
- *Salvia apiana* (white sage scrub)Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum cinereum* (ashy buckwheat scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Hazardia squarrosa* (sawtooth golden bush scrub) Shrubland Alliance
- *Isocoma menziesii* (Menzie's golden bush scrub)Shrubland Alliance
- *Lotus scoparius LotusAcmispon scoparius*([*Acmispon glaber*] deer weed scrub) Shrubland Alliance
- *Lupinus albifrons* (silver bush lupine scrub) Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub) Shrubland Alliance

Native Grassland:Consists of at least 10 percent cover of native herbaceous plants (grasses and forbs) with the remaining coverage similar to non-native grasslands.Small patches of native grassland can be found scattered throughout the SEA, mostly in openings in coastal sage scrub and mixed with non-native grasslands.

Grassland communities consist of low, herbaceous vegetation that is dominated by grasses.Grasslands also harbor native forbs and bulbs, as well as naturalized annual forbs.Grasslands within the SEA include both non-native grasslands and native grasslands.Non-native grassland consists of dominant invasive annual grasses that are primarily of Mediterranean origin.Dominant species found within this community include wild oat, slender oat, red brome, ripgut brome, and herbs, such as black mustard and wild radish.Non-native grasslands are located in small to large patches throughout the SEA in previously disturbed areas, cattle pastures, valley bottoms, and along road sides.

Corresponding MCV communities:

- *Avena* (*barbata, fatua*)Semi-Natural Herbaceous Stands
- *Brassica* (*nigra*)and other mustards Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus, hordeaceus*)-*Brachypodium distachyon* Semi-Natural Herbaceous Stands
- *Bromus rubens-Schismus* (*arabicus, barbatus* [*Bromus madritensis* ssp. *rubens*])Semi-Natural Herbaceous Stands
- *Lolium perenne* ([*Festuca perennis*] perennial rye grass fields) Semi-Natural Herbaceous Stands

Coast Live Oak Woodland: Is dominated by coast live oak and has a poorly developed shrub layer, which may include toyon, currant, gooseberry, laurel sumac, elderberry, and mulefat.Some coast live oak woodlands in the area include scattered California walnut or valley oaks.This community occurs throughout the SEA, often along canyon bottoms and more mesic, north-facing slopes.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland)Woodland Alliance

Valley Oak Woodland:An open woodland community dominated by valley oak.The understory is a grassy savannah composed mostly of non-native grasses.Valley oak woodland occurs mostly on the north slope of the Santa Monica Mountains in shaded ravines and on north-facing slopes.

Corresponding MCV communities:

- *Quercus lobata* (valley oak woodland) Woodland Alliance

Walnut Woodland:An open woodland dominated by Southern California black walnut. Occurring on moist, fine-textured soils, the open tree canopy usually has a grassy understory.Other characteristic species include coast live oak, sugar bush, and skunk bush.This community occurs mostly on the north slope of the Santa Monica Mountains in shaded ravines and on north-facing slopes.

Corresponding MCV communities:

- *Juglans californica* (California walnut groves) Woodland Alliance

Southern Willow Scrub: A riparian community consisting of dense, broad-leafed, winter-deciduous riparian thickets occurring within and adjacent to watercourses.The dominant species of this community within the SEA are arroyo willow with lesser amounts of mulefat.This community occurs in segments along portions of several of the drainages as well as along the periphery of many of the ponds and lakes throughout the SEA.

Corresponding MCV communities:

- *Salix exigua* (sandbar willow thickets)Shrubland Alliance
- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance

Cottonwood-Willow Riparian Forest:An open broad-leafed winter-deciduous riparian forest dominated by Fremont cottonwood, black cottonwood, black willow, and red willow.This community occurs in segments along of many of the drainages, ponds, and lakes throughout the SEA.

Corresponding MCV communities:

- *Populus fremontii* (California sycamore woodlands) Forest Alliance
- *Salix gooddingii* (black willow thickets) Woodland Alliance
- *Salix laevigata* (red willow thickets) Woodland Alliance
- *Populus trichocarpa* (black cottonwood forest) Forest Alliance

Sycamore-Alder Riparian Woodland:Atall, open, broad-leafed, winter-deciduous streamside woodland dominated by western sycamore and alder.These stands often form a closed canopy forest and even may appear as trees scattered in a shrubby thicket of sclerophyllous and deciduous species.This community is found infrequently within the SEA along the lower reaches of several major creeks.

Corresponding MCV communities:

- *Platanus racemosa* (California sycamore woodlands) Woodland Alliance
- *Alnus rhombifolia* (white alder groves)Forest Alliance

Oak Riparian Forest:An open woodland of dense evergreen sclerophyllous riparian woodland dominated by coast live oak.This type appears to be richer in herbs and poorer in understory shrubs than other riparian communities.This community occurs along many streams and canyon bottoms scattered throughout the SEA.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland)Woodland Alliance

Freshwater Marsh:Develops in areas of still or slow-moving permanent freshwater.This community is dominated by the perennial, emergent monocot cattails, which reach a height of four to five meters and often form a closed canopy.Bulrushes are dominant below the cattail canopy.Freshwater marsh is relatively uncommon.It occurs in small patches in natural or created sinks with water sources.

Corresponding MCV communities:

- *Phragmites australis* (common reed marshes) HerbaceousAlliance and Semi-Natural Stands
- *Lepidium latifolium* (perennial pepper weed patches) Semi-Natural Herbaceous Stands
- *Eleocharis macrostachya* (pale spike rush marshes) Herbaceous Alliance
- *Schoenoplectus californicus* (California bulrush marsh) Herbaceous Alliance
- *Typha* (*angustifolia, domingensis, latifolia*)(cattail marshes) Herbaceous Alliance
- *Sarcocornia pacifica* (*Salicornia depressa*)(pickleweed mats) Herbaceous Alliance
- *Juncus arcticus* (var. *balticus, mexicanus*) (Baltic and Mexican rush marshes)Herbaceous Alliance
- *Juncus effusus* (soft rush marshes) Herbaceous Alliance
- *Lemna* (*minor*) *and Relatives* (duckweed blooms)ProvisionalHerbaceous Alliance

Salt Marsh:Similar to the freshwater marsh described above, but with more salt-tolerant hydrophytes present.Species associated with this community include cattails, pickleweed, and saltgrass.Salt marsh is rare. Within the SEA it is known only from Malibu Lagoon and in the County, and only two other places.

Corresponding MCV communities:

- *Distichlis spicata* (salt grass flats) Herbaceous Alliance
- *Spartina foliosa* (California cordgrass marsh) Herbaceous Alliance
- *Arthrocnemum subterminale* (Parish's glasswort patches) Herbaceous Alliance
- *Atriplex lentiformis* (quailbush scrub) Shrubland Alliance

Rock Outcrop:A sparsely vegetated community occurring on cliffs and rock outcroppings of sedimentary, metamorphic, and volcanic rocks along the ridges and peaks of the hills and mountains.Between the rocks and in the crevices, the few plants found are usually representative of a chaparral species composition.Other plants often found on the rock faces in protected areas include *Dudleya*, *Selaginella*, and various lichens.

Corresponding MCV communities:

No corresponding communities at this time

Disturbed or Barren Areas: Areas that either completely lack vegetation or are dominated by ruderal species.Ruderal vegetation typically found within the SEA includes non-native grasses and a high proportion of weedy species, including black mustard and thistle species.Several disturbed areas are scattered throughout the SEA and take the form of residential developments, paved roads, fire breaks, dirt access roads, trails, and other similarly disturbed areas.

Corresponding MCV communities:

No corresponding communities at this time

Wildlife

Wildlife within the SEA is generally diverse and abundant due to large acreages of natural open space and diversity of habitat types.While a few wildlife species are entirely dependent on a single vegetative community, the entire mosaic of all the vegetation communities within the SEA and adjoining areas constitute a functional ecosystem for a variety of wildlife species, both within the SEA and as part of the regional ecosystem.

The analysis of invertebrates is severely limited due to the lack of data; the SEA, however, undoubtedly supports healthy populations of a diverse assortment of invertebrate species.Amphibian populations are plentiful in the SEA due to the high moisture content provided by coastal conditions as well as the large number of drainages and year-round water supplies.The SEA is also likely to support a variety of amphibians within the moister woodland areas and canyon bottoms.Many habitat characteristics essential to reptiles are present within the SEA.These include rock outcroppings that allow for high visibility and small mammal burrows for cover and escape from predators and extreme weather.These characteristics, as well as the variety of habitat types present, are likely to support a wide variety of reptilian species.

The scrubland, woodland, riparian, and grassland habitats in the SEA provide foraging and cover habitat for year-round residents, seasonal residents, and migrating song birds.In addition, the SEA encompasses many year-round water sources located throughout the SEA and abundant raptor foraging, perching, and nesting habitat along the northern slopes of the Santa Monica Mountains.The southern edge of the SEA, along the coast, is part of the Pacific Flyway.The combination of these resources, as well as the confluence of many community types provides an unusually high diversity of bird species. Mammal populations within the SEA are diverse and reflect the large size of the SEA and great variation in topography and community types.

All wildlife species previously recorded, as well as those expected to occur, within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEAs*.Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

The SEA contains major features that are important to wildlife movement. For the mammals and other large terrestrial wildlife, it is important to recognize the crossing area of State Route-101 freeway at Liberty Canyon, and this has been detailed in the General Boundary and Resources Description section. Future highway modifications in this far western area of the County may take the need for wildlife connectivity into account. On the eastern end of the mountains (separated from

the SEA by the communities of Brentwood and Encino in the City of Los Angeles) the California Department of Transportation, or Caltrans, has undertaken widening conversion of one of the bridges to incorporate a vegetated area on the bridge that will encourage wildlife transit between the mountain sections west and east of Interstate-405. This is the first such endeavor in County.

The many natural drainages and ridgelines of the Santa Monica Mountains connect populations in a netlike web, and development should always take account of the importance of these natural areas to wildlife connectivity.

The major coastal drainages with natural habitat shading and cooling the waters support a very unique and rare wildlife movement, which is the spawning runs of the federally-endangered southern steelhead. Spawning run areas and young fish habitat are in critical habitat areas of Arroyo Sequit, Malibu, and Topanga Canyons. Historically, steelhead were known from Solstice and Zuma canyons as well, and it is likely that all the major drainages that once had perennial water and extended to the shore in the rainy season supported this species.

Although wildlife movement is hampered by rural development in the SEA, animals are still able to move through the Santa Monica Mountains in many areas.Due to its large size and topographic complexity, linkages in many directions occur within the SEA. However, there are also various bottlenecks.Edelman (1990) identifies Malibu Creek State Park as the central core habitat area in the Santa Monica Mountains, serving as a connective hub between the Simi Hills to the north and the open space preserves of Topanga State Park to the east, and Mugu State Park to the west (which is near the Ventura-Los Angeles County line, but within Ventura County). These linkages allow movement among large open space areas within the SEA as well as between areas outside the SEA, such as the Simi Hills and the western extent of the Santa Monica Mountains in Ventura County.The genetic flow through these areas is crucial in maintaining the diversity and viability of the species within the Santa Monica Mountains.Open space linkages between Kanan Road and Calabasas Parkway along State Route-101, as indicated by the National Park Service, are of particular importance for continued connectivity of wildlife populations, due to a lack of alternative routes and encroachment of development (Nelson, 2000).Although there are significantly large open spaces within the SEA, maintaining habitat linkages between them is critical in providing for long-term sustainability.A wide variety of wildlife use linkages throughout the SEA, including mountain lion, coyote, mule deer, bobcat, and a number of medium-sized mammals.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas."Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species.The SEA has a number of these for a number of species, as discussed in the General Boundary and Resources Description section.The Santa

MonicaMountainsSEA has critical habitat for the southern steelhead (fish), the tidewater goby, Braunton's milkvetch, and Lyon's pentachaeta.There is proposed critical habitat for the western snowy plover in the SEA.

Sensitive Plan Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.These communities include coastal sage chaparral scrub, native grassland, valley oak woodland, walnut woodland, southern willow scrub, southern cottonwood-willow riparian forest, sycamore-alder woodland, southern coastal live oak riparian forest, fresh-water swamp, and alkali swamp, all of which occur throughout the SEA.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following species occur, or are known to have occurred, or have the potential to occur in the SEA area:

- Santa Susana tarplant (*Deinandra minthornii*)~~CDFG~~CDFW Rare,RPR 1B.2
- Lyon's pentachaeta (*Pentachaeta lyonii*)FE,SE,RPR 1B.1
- Beach spectaclepod, (*Dithyrea maritima*)ST,RPR 1B.1
- Blochman's dudleya (*Dudleya blochmaniae* ssp*. blochmaniae*) FT,RPR 1B.2
- Marcescent dudleya (*Dudleya cymosa* ssp. *marcescens*)FT,RPR, 1B.2]
- Santa Monica dudleya (*Dudleya cymosa* ssp. *ovatifolia*)FT,RPR 1B.2
- Braunton's milk-vetch (*Astragalus brauntonii*)FE,RPR 1B.1
- Salt marsh bird's beak (*Chloropyron maritimum* ssp. *maritimum*)FE, SE, RPR 1B.2

In addition, the following species considered by CNPS to be rare, threatened or endangered have the potential to occur:

- Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*)RPR 2.2
- Southern tarweed (*Centromadia parryi* ssp*. australis*)RPR 1B.1
- Coulter's goldfields (*Lasthenia glabrata* var*. coulteri*)RPR 1B.1
- Coulter's saltbrush (*Atriplex coulteri*)RPR 1B.2
- Parish's brittlescale (*Atriplex parishii*)RPR 1B.1
- Mud nama (*Nama stenocarpum*)RPR 2.2
- Salt spring checkerbloom (*Sidalcea neomexicana*)RPR 2.2
- Ojai navarretia (*Navarretia ojaiensis*)RPR 1B.1
- Parry's spineflower (*Chorizanthe parryi* var*. parryi*)RPR 1B.1
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2

Sensitive Animal Species

The following vertebrate species are state and/or federally-listed endangered or threatened, and are known to occur or have the potential to occur in the SEA:

- Tidewater goby (*Eucyclogobius newberryi*) FE,SSC
- Steelhead – Southern California ESU (*Onchorynchus mykiss irideus*)FE,SSC
- Western snowy plover (*Charadrius alexandrinus nivosus*)FT, ABC, SSC, BCC
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)FC, FSS, BCC
- Southwestern willow flycatcher (*Empidonax traillii extimus*)FE, SE, ABC
- American peregrine falcon (*Falco peregrinus anatum*) FD, SD CDF, ~~CDFG~~CDFW Fully Protected, BCC
- Bald eagle (*Haliaeetus leucocephalus*)FD, SE, CDF, ~~CDFG~~CDFW Fully Protected, FSS, BCC
- Bank swallow (*Riparia riparia*)ST
- California least tern (*Sternula antillarum browni*)FE, SE, ABC, ~~CDFG~~CDFW Fully Protected
- Least Bell's vireo (*Vireo bellii pusillus*)FE, SE, ABC

The western snowy plover, which feeds and resides in the wrack line areas,has designated critical habitat on Zuma Beach from Trancas Canyon to the northeastern side of Point Dume (within the Point Dume CRA). This is proposed to expand on Point Dume, but also to expand to include Malibu Beach, from the pier to Malibu Point, and the area around the seaward side of the Malibu Lagoon,

which is included in this SEA (where it contacts the Malibu Coastline CRA).

The southern steelhead lives in the coastal and oceanic marine waters for most of its life.It uses the coastal streams for spawning runs to breed.Some fish may die on these runs, but many of this particular species return to the ocean and may spawn again.The creeks become the habitat for the first year of the young fish's lives.Here they mature to smolts and make their run to the ocean.In the ocean, they mature and spend most of their lives.The Arroyo Sequit has the lower section and much of its west fork designated as critical habitat, withknown, naturally occurring spawning beds and habitat for young fish.The lower areas of Malibu Creek and Topanga Creek are also designated critical habitat.

In addition, following ~~CDFG~~CDFW-listed Special Animals have the potential to utilize habitats within the SEA:

- Callippe silverspot butterfly (*Speyeria callippe callippe*)FE
- Arroyo chub (*Gila orcutti*)FSS, SSC
- California red-legged frog (*Rana draytonii*)FT, SSC
- Western spadefoot (*Spea hammondii*)BLMS,SSC
- Coast range newt (*Taricha torosa*)SSC
- Silvery legless lizard (*Anniella pulchra pulchra*)SSC, FSS
- Southwestern pond turtle (*Emys marmorata*)BLMS, SSC, FSS
- San Diego mountain kingsnake (*Lampropeltis zonata pulchra*)FSS,SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, SSC, FSS
- Coast patch-nosed snake (*Salvadora hexalepis virgultea*)SSC
- Two-striped garter snake (*Thamnophis hammondii*)BLMS, SSC, FSS
- Cooper's hawk (*Accipiter cooperii*)~~CDFG~~CDFW Watch List
- Sharp-shinned hawk (*Accipiter striatus*)~~CDFG~~CDFW Watch List
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Bell's sage sparrow (*Amphispiza belli belli*)ABC, ~~CDFG~~CDFW Watch List, BCC
- Golden eagle (*Aquila chrysaetos*)CDF, ~~CDFG~~CDFW Fully Protected, ~~CDFG~~CDFW Watch List, BCC
- Short-eared owl (*Asio flammeus*)ABC, SSC

- Long-eared owl (*Asio otus*)SSC
- Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*)SSC, FSS, BCC
- California horned lark (*Eremophila alpestris actia*)~~CDFG~~CDFW Watch List
- Northern harrier (*Circus cyaneus*)SSC
- Black swift (*Cypseloides niger*)ABC, SSC, BCC
- Yellow warbler (*Dendroica petechia brewsteri*) SSC, BCC
- White-tailed kite (*Elanus leucurus*)~~CDFG~~CDFW Fully Protected
- Merlin (*Falco columbarius*)~~CDFG~~CDFW Watch List
- Prairie falcon (*Falco mexicanus*)~~CDFG~~CDFW Watch List, BCC
- Yellow-breasted chat (*Icteria virens*)SSC
- Least bittern (*Ixobrychus exilis*)SSC, BCC
- Loggerhead shrike (*Lanius ludovicianus*)SSC, BCC
- California brown pelican (*Pelecanus occidentalis californicus*)FD, SD, ~~CDFG~~CDFW Fully Protected
- Pallid bat (*Antrozous pallidus*)BLMS, SSC, FSS, WBWG:High Priority
- Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)BLMS, SSC, FSS, WBWGHigh Priority
- Spotted bat (*Euderma maculatum*)BLMS, SSC, WBWGHigh Priority
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWGHigh Priority
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)SSC
- South coast marsh vole (*Microtus californicus stephensi*)SSC
- Occult little brown bat (*Myotis lucifugus occultus*)~~CDFG~~CDFW Special Animals List, WBWGMedium Priority
- San Diego desert woodrat (*Neotoma lepida intermedia*)SSC
- Los Angeles pocket mouse (*Perognathus longimembris brevinasus*)SSC, FSS
- American badger (*Taxidea taxus*)SSC

Regional Biological Value

The SEA meets all SEA designation criteria and supports many regional biological values.Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THESANTA MONICA MOUNTAINS SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	The SEA provides habitat for the following listed species:Lyon's pentachaeta (FE, SE); beach spectaclepod (ST); Blochman's dudleya (FT); marcescent dudleya (FT); Santa Monica dudleya (FT); Braunton's milk-vetch (FE); salt marsh bird's beak (FE, SE); tidewater goby (FE); steelhead – Southern California ESU (FE); western snowy plover (FT); western yellow-billed cuckoo (SE); southwestern willow flycatcher (FE, SE); American peregrine falcon (SE); bald eagle (FT); bank swallow (ST); California least tern (FE, SE); least Bell's vireo (FE, SE). The SEA contains designated critical habitat for Lyon's pentachaeta, Braunton's milk-vetch, tidewater goby, steelhead, and western snowy plover.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	Upper La Sierra Canyon contains an unusually rich and diverse stand of canyon flora, including marcescent dudleya, creek dogwood, and many unusually large specimens of other rare plant species; Malibu Lagoon is the only intact natural lagoon between Point Mugu in Ventura County and Anaheim Bay in Orange County; Malibu Canyon contains a unique mix of floral species that are uncommon in the region, such as black cottonwood and leather leaf ash, as well as a regionally unique mixture of inland and coastal species; regionally rare volcanic rock formations create unique communities where they occur.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	Malibu Lagoon is the only natural lagoon in the County; upper La Sierra Canyon contains an unusually rich and diverse stand of canyon flora, including marcescent dudleya, creek dogwood, and many unusually large specimens of other rare plant species; and Malibu Canyon contains a regionally unique mix of floral species htat are uncommon in the County, such as black cottonwood and leather leaf ash, as well as a unique mix of inland and coastal species.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The Malibu Lagoon and the upstream riparian woodland in Malibu Creek is an important migrating bird refuge, with over 200 species recorded.Tuna and Pena canyons are an important area to migratory birds due to their combined qualities of healthy vegetation, riparian woodland, surface moisture, undeveloped land, and an unobstructed opening to the coast.The SEA also contains habitat linkages between large open space areas within the SEA and areas outside the SEA, such as the Simi Hills and the western extent of the Santa Monica

Criterion		Status	Justification
			Mountains in Ventura County.Such linkages are crucial in maintaining regional plant and animal population health and viability.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The SEA includes a myriad of unique and pristine natural areas that are important for nature study and scientific research; the range of extremes of many species, such as the California juniper, linear-leaved goldenbush, splendid mariposa lily (*Calochortus venustus*), and valley oak; and disjunct and unique populations of redshank, island mountain-mahogany, lyre snake, mountain quail, hirsute rain-beetle, and the Jerusalem cricket.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Zuma Canyon is one of the last major drainages in the Santa Monica Mountains with a year-round stream that supports a rich riparian community and remains in an undeveloped state; Cold Creek includes an excellent example of an undisturbed natural sandstone basin with springs and a perennial stream; Tuna and Pena canyons are the last drainages in the central and eastern Santa Monica Mountains that have no development between the canyon mouth at the coast and upper areas of the watershed; Palo Comado and Cheseboro canyons support one of the last examples of an oak woodland savannah of any significant size in the County; Temescal, Rustic, and Sullivan canyons represent contiguous, self-contained watersheds that are large enough to support representative samples of native flora and fauna; the area surrounding Encino Reservoir supports the best undisturbed stand of an inland chaparral, coastal sage scrub, and streamside vegetation remaining on the inland slope of the Santa Monica Mountains.

In conclusion, the area is an SEA because it contains: A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Santa Susana Mountains and Simi Hills SEA

Location

General

The Santa Susana Mountains and Simi Hills Significant Ecological Area (SEA) is located northwest of the San Fernando Valley within unincorporated areas of the County and the City of Los Angeles, west of Chatsworth. The area is south of State Route-126 and the Santa Clara River, west of the Interstate-5, and includes much of the Santa Susana Mountains to the north, the Santa Susana

Pass, Chatsworth Reservoir, and the eastern portion of the Simi Hills to the south.This SEA encompasses much of the natural area of the Santa Susana Mountains in the County. The north face of the Santa Susana Mountains is the southwestern watershed of the Santa Clara River in the County, and on the south face, the Santa Susana Mountains are part of the direct coastal watershed as well as part of the watershed of the Los Angeles River. The Simi Hills are part of the direct coastl drainage in their southern area. The variations in vegetation communities are extensive.The area in the Santa Susana Mountains covered by the SEA is considered an important connective wildlife corridor among the San Gabriel Mountains, the Santa Clara River, and the Santa Monica Mountains.

The SEA is located at least partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles: Calabasas, Canoga Park, Oat Mountain, Santa Susana, Val Verde, and Newhall.

General Boundary and Resources Description

The entire western boundary of the SEA follows the Ventura-Los Angeles County line from El Escorpion Park, west of the intersection of Valley Circle Boulevard and Vanowen Street in the West Hills community of the San Fernando Valley, and north to an area just south of the Santa Clara River near Salt Canyon Road. El Escorpion Park is adjacent to state park land just across the Ventura-Los Angeles County line. The small ridgeline where the SEA begins just south of El Escorpion Park separates the coastal drainage of Las Virgenes (tributary of Malibu Creek) from drainages that flow into the San Fernando Valley and the Los Angeles River. El Escorpion Park is at the southern end of Bell Canyon Park, which is also on Ventura-Los Angeles County line. Thewatercourse of Bell Canyon flows through the park. The SEA continues north, including the natural watershed of Dayton Canyon. Here on the southern side of Dayton Canyon is designated critical habitat for the Braunton's milk vetch (*Astragalus brauntonii*), which is alocoweed that prefers a substrate of intermixed sandstone and carbonate beds, which is probably deposited at the margins of a former seacoast.The SEA circles around the community of Lakeside Park , which is excluded from the SEA, and then encircles and includes the Chatsworth Reservoir along boundaries of private property.The western boundary of the SEA follows the Ventura-Los Angeles County line, but bends to exclude development in upper Woolsey Canyon and Chatsworth Lake Manor.

From Chatsworth Reservoir, the SEA continues north with the west side along the Ventura-Los Angeles County line and the east side tracing natural habitat at the edge of the Simi Hills and the San Fernando Valley. The SEA extends eastward to include all of the Santa Susana Pass area, much of which is preserved in the Santa Susana Pass State Historic Park. Just across the Ventura-Los Angeles County line nearState Route-118 in Ventura County are Corriganville Park, a former and current natural movie production area, and Rocky Peak Park.Corriganville is a regional park of the City of Simi Hills; Rocky Peak Park is administered by the Santa Monica Mountains Conservancy.Rocky Peak Park is the former Runkle Ranch and stretches from State Route-118 five miles northward to Las Llajas Canyon.The Park is a vital wildlife habitat linkage between the Simi Hills and the Santa Susana Mountains. Spectacular sandstone boulders, outcroppings, oak savannahs, and perennial water sources provide diverse habitat for vertebrates and a number of rare plants. The Ventura-Los Angeles County line and the SEA boundary cross directly over Rocky Peak here.

A very important wildlife passage between the Santa Susana Mountains and the Simi Hills is just west of the Ventura-Los Angeles County line connecting Corriganville Park and the Runkle Ranch. It

is a broad tunnel under the freeway, which enabled the connection of the property that was divided by constructing State Route-118. This tunnel connects dirt roads and trails on either side, and is regularly used by mountain lions and other wildlife.

Most of the SEA from State Route-118 northward is designated critical habitat for the coastal California gnatcatcher (*Polioptila californica californica*), which is a diminutive bird that is becoming rare due to loss of its preferred habitat, which is coastal sage scrub.The critical habitat for this bird extends across the Ventura-Los Angeles County line along the extent of the Santa Susana Mountains into Ventura County.

North of State Route-118, the SEA excludes development in the area of Hialeah Springs (but includes the springs), and circles round the development to include the more sparse settlement in the Deer Lake Highlands area.The SEA boundary goes north along the watercourse of Browns Canyon to the confluence with Mormon Canyon.Here the SEA boundary climbs the ridgeline that separate Browns Canyon and Mormon Canyon to include Browns Canyon and the Michael D. Antonovich RegionalPark at Joughin Ranch, and exclude the Mormon Canyon.Continuing up the ridge to its origin on the crest of Oat Mountain, the SEA boundary turns eastward along the ridgeline, excluding the oil fields in the upper reaches of Mormon Canyon and including the extensive natural areas of the north slope of the Santa Susana Mountains.

Along the Ventura-Los Angeles County line north of Rocky Peak, the SEA boundary crosses Blind Canyon (draining to San Fernando Valley), then Llajas Canyon (draining to Simi Valley and ultimately Mugu Lagoon), then El Toro and Chivo canyons (also draining to Mugu Lagoon).Northwest of Chivo, the crest of the Santa Susana Mountains is crossed, and drainages are tributaries of Salt Canyon and the Santa Clara River.The north edge of the critical habitat for the coastal California gnatcatcher is crossed near the crest, where the south-facing slopes that favor coastal sage scrub give way to the ridgeline and north-facing slopes that promote denser chaparral and oak woodlands.At the northern boundary of the SEA, the Santa Clara River SEA is contiguous as is the critical habitat for the state and federally-endangered least Bell's vireo (*Vireo bellii pusillus)*, which is a small bird that usually nests next to perennial water.

From the northwesterly corner, the boundary travels east along the north side of Salt Canyon, and then along the northern side of the Salt Canyon East Fork.Where the East Fork turns south, the SEA boundary continues east to encompass the steeper southern areas along Potrero Canyon and all of the Pico Canyon drainage south of Potrero.The SEA boundary is truncated at the Stevenson Ranch development, including the Wickham Canyon tributary of Pico in the SEA, but excluding most of Dewitt Canyon.This boundary of the SEA is essentially following the northern edge of the Salt Creek open space that was approved with the Newhall Ranch Specific Plan.In the vicinity of Pico Canyon, the boundary continues eastward to encompass the Lyon Canyon watershed and an unnamed watershed just north of Lyon up to the west side of Interstate-5.Along Interstate-5, the SEA boundary continues along the line of natural vegetation (west and southwest side of Gavin Canyon) including the watersheds of tributaries Towsley, Wiley, Leaming, Rice, and East canyons.The boundary continues east along the western edge of Interstate-5 to an area just west of theAngeles City line, near the interchange with State Route-14. Here the boundary excludes the drainage of Sunshine Canyon, which is involved in the Sunshine Canyon Landfill used by both the City of Los Angeles and the County.Critical habitat for the coastal California gnatcatcher is the watersheds of Towsley, Wiley, Rice, and East canyons south of the Interstate-5 below about the 2400feet elevation contour.

North across the Interstate-5 is the Newhall Wedge.The Newhall Wedge is a very rugged part of the Santa Susana Mountains, with substantial natural vegetation of oak woodlands, chaparral, and coastal sage scrub.The Newhall Wedge is truncated by the flood plains of tributaries of the South Fork of the Santa Clara River to the north, east and west, and these flood plains have had extensive development as the City of Santa Clarita.(Gavin Canyon is one of these tributaries.)Important connective areas are the road crossings of the Interstate-5 and State Route-14.The connection to the Santa Clara River SEA is the Los Pinetos Road underpass of the State Route-14.Consistent wildlife movement has been recorded with motion-activated cameras there.The Weldon Canyon Road overpass of the Interstate-5 is another connection for the Newhall Wedge with the main part of the SEA.The Old Road underpass of the Interstate-5 is a broad connection.The Calgrove underpass is another broad connection, but busy with traffic.Natural areas are adjacent to all these under- and overpasses.The South Fork of the Santa Clara River is formed by the junction of Towsley, Wiley and East canyons in the northeast corner of Michael D. Antonovich Open Space.Its underpass of Interstate-5 has a natural bottom that is used frequently by wildlife, but on the east side of Interstate-5 there is a series of 15feet drops and channeled sides, which is unlikely that terrestrially-tied wildlife would continue into the populated parts of the City of Santa Clarita along the South Fork.Critical habitat for the coastal California gnatcatcher is in most of the Newhall Wedge part of the SEA between the Interstate-5 and the Sierra Highway that is just west of State Route-14.

On the west side of Sunshine Canyon, a broad lobe of the SEA extends along the ridgeline, which separates Sunshine and Bee Canyon to include Bee Canyon Park and Mission Point of O'Melveny Park.This is an area with walnut woodlands, oak woodlands, grasslands, and chaparral including coastal sage scrub, which is the diverse and green vegetation typical of the Santa Susana Mountains.Critical habitat for the coastal California gnatcatcher covers O'Melveny Park, except for the ridgeline of Mission Point, which is above the 2400 feet contour. The SEA boundary travels west from Mission Point along the ridgeline above the Aliso Canyon Oil Field and turns south at the western edge of the Aliso Canyon Oil Field, along the ridgeline between Mormon and Browns canyons. Critical habitat for the coastal California gnatcatcher extends below about the 2400 feetcontour (including Mormon and Browns canyons) and roughly is within the SEA north of State Route-118.

The SEA includes a variety of topographic features; the northern portion of the SEA encompasses Oat Mountain and much of the Santa Susana Mountains from theVentura-Los Angeles County line east to Interstate-5. Portions of many of the canyons associated with the Santa Susana Mountains and Oat Mountain are also included, such as Salt Canyon, Potrero Canyon, Pico Canyon, Towsley Canyon, El Toro Canyon, Sulphur Canyon, Devil Canyon, Ybarra Canyon, Browns Canyon, Bee Canyon, and Mormon Canyon.Several perennial stream areas occur within these canyons, and there are many natural springs.The north slopes of the Santa Susana Mountains are within the Santa Clara River watershed, which drains the Los Padres National Forest to the north, the Angeles National Forest to the northeast and east, and the Santa Susana Mountains to the south and southeast.The remainder of the SEA is within the Los Angeles River watershed.The majority of the land in the SEA is natural open space with very sparse disturbances in the form of ranches, oil wells, and unimproved access roads.The SEA consists of east-west and northwest trending primary ridges and north-south trending secondary ridges.

The peak of Oat Mountain represents the highest point in the SEA at 3,747 feet above mean sea level (MSL).From Oat Mountain, one can appreciate the diverse influences that create extremely diverse habitat within this SEA.One can see downstream along the Santa Clara River to the mouth

of the Pacific Ocean and to the northern Channel Islands.Across the San Fernando Valley are the Santa Monica Mountains, and the Simi Hills enclose the west end of the Valley.To the east are the ascending ridges of the San Gabriel Mountains, and to the northeast the Santa Clara River continues upstream towards the Antelope Valley and the Mojave Desert.Coastal, valley, montane, and desert influences all meet within this small mountain range.

Open space within the SEA supports this great variety of communities, but is dominated by chaparral, oak woodlands, coastal sage scrub, bigcone Douglas-fir-canyon oak woodland, and grasslands; however, there are numerous examples of special vegetation.Not uncommon are cherry woodlands, which are dominated by hollyleaf cherry (Prunus ilicifolia). These mountains are a meeting area of the (regular) Douglas fir (*Pseudotsuga menziesii*) and the bigcone Douglas-fir (*Pseudotsuga macrocarpa*).There are a number of special endemic plants, such as the Santa Susana tarweed (*Deinandra minthornii*), which is a tarplant like few others since it is perennial.Its distribution spreads through the Simi Hills and into the Santa Monica Mountains, but it is primarily at home among the sandstone boulders and terraces, which prevail in the Santa Susana Mountains.The Santa Susana Mountains are the only known place in the County with members of the uncommon Palmer's oak (*Quercus palmeri).*This desert oak can be very long-lived.A clone found in Riverside County was judged to have started from an acorn in the last Ice Age, over 10,000 years ago.Other oaks with groves in the Santa Susanas include coast live oak (*Quercus agrifolia*), valley oak (*Q. lobata*), canyon live oak (*Q. chrysolepis*), scrub oak (*Quercus berberidifolia*), and interior live oak (*Q. wislezenii*).The numerous creeks and canyons support riparian scrub and woodland communities with oaks, sycamores, and willows.There are walnut woodlands of the California black walnut (*Juglans californica*) mixed with flowering ash (*Fraxinus dipetala*) and Mexican elderberry (*Sambucus mexicana*) and coast live oak.Flowering ash may be a tree up to 60 feet tall in the Santa Susana Mountains, whereas it usually is a low tree or even spindly shrub.The woodlands dominated by walnuts and flowering ash appear to be unique to the Santa Susana Mountains.The bigcone Douglas-fir-canyon live oak forest at higher elevations represents one of the northwesternmost examples of this community.At its southern end, the SEA includes the eastern portion of the Simi Hills, including the east-facing slopes descending from Chatsworth Peak.Chatsworth Reservoir forms a portion of the south boundary and is currently dry, except for a small detention basin north of the reservoir.

Chatsworth Reservoir has a variety of very interesting habitat with several protected avian communities of songbirds and geese, which makes it valuable for bird study by students, researchers, and naturalists. There is a perennial pond at the north end that supports freshwater marsh, which is an extremely scarce habitat in the County and Southern California.This pond is on the Pacific Flyway, and supports numerous kinds of waterfowl during the spring and fall migration periods, especially because of the adjacent grasslands.The periphery of the reservoir is savannah, with a mixture of valley and coast live oaks (*Quercus lobata* and *Q. agrifolia*), some in small stands.

The majority of the SEA is within the unincorporated area of the County.

Vegetation

The plant communities within the SEA are composed of numerous plant species.These plant species are adapted to a Mediterranean climate with a cool, wet season followed by a hot, dry season.Due to the topographic complexity and coastal and desert influences, the SEA supports a wide diversity of plant species.

Plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendiumof theLos Angeles County SEAs.*Sensitive plant species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of each plant community present within the SEA are given below.These include chaparral, coastal sage scrub, alluvial scrub, coast live oak woodlands, valley oak woodland, mainland cherry forest, non-native grassland, native grassland, southern willow scrub, southern cottonwood-willow riparian forest, and disturbed communities.

Chaparral:Consists of a broad mix of evergreen species and generally occurs below 5,000 feet in Southern California.Dominant species consist of broad-leaved or needle-leafed sclerophyllous (hard-leafed) shrubs, forming a dense, impenetrable cover with little or no understory growth.The understory typically consists of considerable accumulation of leaf litter.In areas of less dense shrub cover, the understory consists of non-native grasses and other annual forbs. Dominant species include chamise, laurel sumac (*Malosma laurina*), hoary-leaf ceanothus (*Ceanothus crassifolius*), chapparal whitethorn (*Ceanothus leucodermis*), and toyon (*Heteromeles arbutifolia*).Chaparral is the dominant plant community within the SEA and covers many of the steep slopes and hillsides in the upper elevations.

Corresponding MCV communities:

- *Adenostoma fasciculatum* (chamise chaparral)Shrubland Alliance
- *Adenostoma fasciculatum-Salvia apiana* (chamise-white sage chaparral) Shrubland Alliance
- *Arctostaphylos glauca* (bigberry manzanita chaparral) Shrubland Alliance
- *Ceanothus crassifolius* (hoary leaf ceanothus chaparral) Shrubland Alliance
- *Ceanothus leucodermis* (chaparral whitethorn) Shrubland Alliance
- *Ceanothus megacarpus* (big pod ceanothus chaparral) Shrubland Alliance
- *Ceanothus spinosus* (greenbark ceanothus chaparral) Shrubland Alliance
- *Ceanothus oliganthus* (hairy leaf ceanothus chaparral) Shrubland Alliance
- *Prunus ilicifolia* (holly leaf cherry chaparral)Shrubland Alliance
- *Rhus ovata* (sugarbush chaparral)Shrubland Alliance

Coastal Sage ScrubCommunities:Consist of drought-deciduous, low, soft-leaved shrubs and herbs on gentle to steep slopes below 3,000 feet in elevation.Several dominant species may occur within scrub communities, with some areas overwhelmingly dominated by one or two species.Californiasagebrush (*Artemisia tridentata*), California buckwheat (*Eriogonum fasciculatum*), California brittle bush (*Encelia californica*), purple sage (*Salvia leucophylla*), and deerweed (*Acmispon glaber*).Coastal sage scrub is found at the lower elevations within the SEA on drier south-facing slopes, but can also be found on the north-facing slopes and canyon of the Santa Susana

Mountains.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Dendromecon rigida* (bush poppy scrub) Shrubland Alliance
- *Isocoma menziesii* (Menzie's golden bush scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub) Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum cinereum* (ashy buckwheat scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Ericameria linearifolia* (narrowleaf goldenbush scrub) Provisional Shrubland Alliance
- *Hazardia squarrosa* (sawtooth golden bush scrub) Shrubland Alliance
- *Lotus scoparius* ([*Acmispon glaber*] deer weed scrub) Shrubland Alliance
- *Lupinus albifrons* (silver bush lupine scrub) Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub) Shrubland Alliance

Alluvial Scrub:Consists of a mixture of shrubs that colonize sandy-gravelly flood deposited soils within intermittent creeks, arroyos, and drier terraces in large washes.This community intergrades with sage scrub communities and riparian communities and, therefore, occurs adjacent to these communities.Great basin sagebrush (*Artemisia tridentata*), scalebroom (*Lepidospartum squamatum*), quail bush (*Atriplex lentiformis*), and skunk bush (*Rhus aromatica*).Alluvial scrub is predominantly found at the northern end of the SEA in Salt Canyon.

Corresponding MCV communities:

- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub)Shrubland Alliance

- *Lepidospartum squamatum* (scalebroom scrub)Shrubland Alliance

- *Malosma laurina* (laurel sumac scrub) Shrubland Alliance

Coast Live Oak Woodlands:Commonly occur along drainages that experience at least a seasonal flow or in other areas under mesic conditions.Soil structure and soil moisture are the most important limiting factors for the survival of oak woodlands; soils must be deep, uncompacted, fertile, well-aerated, and well-drained.This community is dominated by coast live oak.If sufficient groundwateris present, western sycamore (*Platanus racemosa*), which is usually associated with riparian habitats, may also occur in the oak woodland.Oak woodlands occupy areas within the canyons and drainages of the SEA.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance

Valley Oak Woodland:An open-canopy woodland found on deep, well-drained alluvial soils below 2,000 feet.This community is almost exclusively dominated by valley oak (*Quercus* lobata) with a grassy understory to form a savannah-like community.This community is located in small pockets in the eastern portion of the SEA.

Corresponding MCV communities:

- *Quercus lobata* (valley oak woodland) Woodland Alliance

Mainland Cherry Forest:Not well described, but is typically composed of tall stands of holly leaf cherry (*Prunus ilicifolia*) on rocky, dry, north-facing slopes.Within the SEA, coast live oak is co-dominant within this community and can be found in canyons in the northern portion of the SEA.This community can also be found in association with alluvial scrub in the northwestern portion of the SEA as it approaches the Santa Clara River.

Corresponding MCV communities:

- *Prunus ilicifolia* (Holly leaf cherry chaparral) Shrubland Alliance

Grassland Communities:Consist of low, herbaceous vegetation that are dominated by grasses but generally also harbor native forbs and bulbs, as well as naturalized annual forbs.Topographic factors that contribute to grassland presence include gradual slopes or flat areas with deep, well-developed soils in areas below 3,000 above MSL.The species richness of grassland communities is dependent upon a number of land use factors, including intensity and duration of natural or anthropogenic disturbances, such as grazing.Heavily grazed grasslands have a lower species richness.

Native grassland is often associated with coastal sage scrub and is found in pockets in close proximity to coastal sage scrub and non-native grassland.This community consists of at least 10 percent relative cover of native herbaceous plants (grasses and forbs). The remaining vegetative cover is made up of non-native grasses found in annual grassland and a variety of annual, showy flowers, such as golden stars (*Bloomeria crocea*) and blue-eyed grass (*Sisyrinchium bellum*).Small patches of native grassland can be found scattered throughout the SEA mostly in openings in coastal sage scrub and mixed with non-native grasslands.

Corresponding MCV communities:

- Leymus condensatus (giant wild rye grassland) Herbaceous Alliance
- *Nassella cernua* ([*Stipa cernua*] nodding needle grass grassland) Provisional Herbaceous Alliance
- *Nassella lepida* ([*Stipa lepida*] foothill needle grass grassland) Provisional Herbaceous Alliance
- *Nassella pulchra*([*Stipa pulchra*] purple needle grass grassland) Herbaceous Alliance

Non-native grassland consists of dominant invasive annual grasses that are primarily of Mediterranean origin.Dominant species found within this community include slender wild oat (*Avena barbata*), wild oat (*A. fatua*), ripgut brome (*Bromus diandrus*), and red brome (*B. madritensis* ssp. *rubens*).

Corresponding MCV communities:

- *Avena (barbata, fatua)* (Wild oats grasslands) Semi-Natural Herbaceous Stands
- *Brassica (nigra) and other mustards* (Upland mustards) Semi-Natural Herbaceous Stands
- *Bromus (diandrus,hordeaceus)-Brachypodium distachyon* (Annual brome grasslands)Semi-Natural Herbaceous Stands
- *Bromus rubens-Schismus (arabicus, barbatus)* ([*Bromus madritensis* ssp. *rubens*] Red brome or Mediterranean grass grasslands) Semi-Natural Herbaceous Stands
- *Centaurea (solstitialis, melitensis)* (Yellow star-thistle fields)Semi-Natural Herbaceous Stands
- *Lolium perenne* ([*Festuca perennis*] perennial rye grass fields) Semi-Natural Herbaceous Stands

Southern Willow Scrub:A riparian community occurring within and adjacent to watercourses.The vegetation within this community is adapted to seasonal flooding.Southern willow scrub is characterized by dense, broad leafed, winter-deciduous riparian thickets dominated by one or more willow species (*Salix* spp.)Most stands are too dense to allow understory development.The dominant species of this community within the SEA are arroyo willow (*Salix lasiolepis*), and red willow (*S. laevigata*), with less common associates such as mulefat (*Baccharis salicifolia*).This community occurs in segments along portions of the intermittent drainages within the SEA.

Corresponding MCV communities:

- *Salix exigua* (Sandbar willow thickets)Shrubland Alliance
- *Salix lasiolepis* (Arroyo willow thickets) Shrubland Alliance

Southern Cottonwood-Willow Riparian Forest:Consists of an open, broad-leaved, winter-deciduous riparian forest dominated by Fremont cottonwood (*Populus fremontii*), black cottonwood (*P.*

trichocarpa), and several willow species, including arroyo willow and red willow.This community occupies much of the Santa Clara River adjacent to the northern boundary of the SEA, and also occurs within the larger, intermittent and perennial drainages within the SEA.

Corresponding MCV communities:

- *Populus fremontii* (fremont cottonwood forest) Forest Alliance
- *Populus trichocarpa* (black cottonwood forest) Forest Alliance

Disturbed or Barren Areas: Areas that either completely lack vegetation or are dominated by ruderal species.Ruderal vegetation typically found onsite include non-native grasses and a high proportion of weedy species, including tocalote, telegraph weed, tree tobacco, doveweed, black mustard, and thistle species.Several disturbed areas occur scattered throughout the SEA and take the form of residential developments, highways, fire breaks, dirt access roads, trails, transmission poles, and other similarly disturbed areas.

Corresponding MCV communities:

No corresponding communities at this time

Wildlife

Wildlife within the SEA is generally diverse and abundant due to the large acreage of natural open space and the diversity of habitat types.While a few wildlife species are entirely dependent on a single vegetative community, the entire mosaic of all the vegetation communities within the SEA and adjoining areas constitutes a functional ecosystem for a variety of wildlife species; this applies to the SEA and the regional ecosystem.

The analysis of invertebrates in this study is difficult due to the lack of data, although limited studies have been conducted.The SEA is believed to support healthy populations of a diverse assortment of countless invertebrate species.Amphibian populations are generally restricted in semi-arid and arid habitats but may be particularly abundant where riparian areas occur.The SEA is likely to support a variety of amphibians in abundance within wetland areas along the major canyon bottoms and the moister oak woodland areas.Many essential reptilian habitat characteristics, such as open habitats that allow free movement and high visibility, and small mammal burrows for cover and escape from predators and extreme weather, are present within the SEA.These characteristics, as well as the variety of habitat types present, are likely to support a wide variety of reptilian species.

The scrubland, woodland, riparian, and grassland habitats in the SEA provide foraging and cover habitat for year-round residents, seasonal residents, and migrating song birds.In addition, the SEA encompasses many year-round water sources, abundant raptor foraging, perching, and nesting habitat.The combination of these resources, as well as the mosaic of many community types, provide for an unusually high diversity of bird species.Several of these species may use this SEA as their only consistent occurrence in the southeastern portion of the County.

Mammal populations within the SEA are diverse and reflective of the diversity of habitat types.Unlike many other inland hills within the Los Angeles Basin, this SEA is large enough to support relatively stable and large mammal populations despite the urban surroundings; even the large carnivores,

including the black bear and mountain lion, are known from the SEA. This indicates the presence of intact food chains and complete communities that have a complex, resilient food web.

All wildlife species previously recorded, as well as those expected to occur, within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEAs*.Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

The SEA includes several important linkages for wildlife movement.The Simi Hills and Santa Susana Mountains provide a vast open space corridor to foster wildlife movement between the Santa Monica Mountains to the south, San Gabriel Mountains to the east, and Los Padres National Forest to the north in the western San Gabriel Mountains of the Transverse Ranges.Dense, natural habitat associated with the majority of the SEA provides excellent opportunities for concealment and water sources, while the grasslands provide an abundance of prey.Examples of wildlife that use these linkages include mountain lion (*Puma concolor*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), and a number of medium-sized animals.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas."Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species. Critical habitats for the Braunton's milkvetch and coastal California gnatcatcher are described in the General Boundary and Resources Description section.

Sensitive Plan Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.These communities include chamise-white sage chaparral, holly leaf cherry chaparral, California brittle bush scrub, white sage scrub, narrowleaf goldenbush scrub, sawtooth golden bush scrub, scalebroom scrub, valley oak woodland, holly leaf cherry chaparral, giant wild rye grassland, nodding needle grass grassland, foothill needle grass grassland, purple needle grass grassland, Fremont cottonwood forest, and black cottonwood forest, which occur throughout the SEA.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Norris' beard moss (*Didymodon norrisii*)RPR 2.2
- Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*)RPR 2.2
- Braunton's milk-vetch (*Astragalus brauntonii*)FE, RPR 1B.1
- Nevin’s barberry (*Berberis nevinii*)FE, SE, RPR 1B.1
- Round-leaved filaree (*California macrophylla*)RPR 1B.1
- Peirson's morning-glory (*Calystegia peirsonii*)RPR 4.2
- Southern tarplant (*Centromadia parryi* ssp. *australis*)RPR 1B.1
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)FC, SE, RPR 1B.1
- Santa Susana tarplant (*Deinandra minthornii*)Rare, RPR 1B.2
- San Gabriel bedstraw (*Galium grande*)RPR 1B.2
- Palmer's grapplinghook (*Harpagonella palmeri*)RPR 4.2
- Newhall sunflower (*Helianthus inexpectatus*)RPR 1B.1
- Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*)RPR 1A
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)RPR 1B.1
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)RPR 1B.1
- Davidson’s bushmallow (*Malacothamnus davidsonii*)RPR 1B.2
- Mud nama (*Nama stenocarpum*)RPR 2.2
- Moran’s navarretia (*Navarretia fossalis*)FT, RPR 1B.1

- Ojai navarretia (*Navarretia ojaiensis*)RPR 1B.1
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*)RPR 2.2
- Chaparral ragwort (*Senecio aphanactis*)RPR 2.2
- Greata's aster (*Symphyotrichum greatae*)RPR 1B.3
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)RPR 1B.2
- Late-flowered mariposa lily (*Calochortus fimbriatus*)RPR 1B.2
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2
- Chaparral nolina (*Nolina cismontana*)RPR 1B.2
- California Orcutt grass (*Orcuttia californica*)FE, SE, RPR 1B.1

Sensitive Animal Species

The following vertebrate species are state and/or federally-listed as endangered or threatened, and have the potential to occur in the SEA:

- Riverside fairy shrimp (*Streptocephalus woottoni*)FE
- Unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*)FE, FSS, SE, ~~CDFG~~CDFW Fully Protected
- Arroyo toad (*Anaxyrus californicus*)FE, SSC
- California red-legged frog (*Rana draytonii*)FT, SSC
- Sierra Madre yellow-legged frog (*Rana muscosa*)FE, FSS, SSC
- Western spadefoot (*Spea hammondii*)BLMS, SSC
- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- Rosy boa (*Charina trivirgata*)BLMS, FSS
- San Bernardino ringneck snake (*Diadophis punctatus modestus*)FSS
- Western pond turtle (*Emys marmorata*)BLMS, FSS, SSC
- San Diego mountain kingsnake (*Lampropeltis zonata pulchra*)FSS, SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC

- Coast patch-nosed snake (*Salvadora hexalepis virgultea*)SSC
- Two-striped garter snake (*Thamnophis hammondii*)BLMS, FSS, SSC
- Cooper's hawk (nesting) (*Accipiter cooperii*)~~CDFG~~CDFW Watch List
- Tricolored blackbird (nesting colony) (*Agelaius tricolor*)BCC, BLMS, SSC, USBC, AWL, ABC
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Grasshopper sparrow (*Ammodramus savannarum*)~~CDFG~~CDFW Special Animals List
- Bell's sage sparrow (*Amphispiza belli belli*)BCC, ~~CDFG~~CDFW Watch List
- Golden eagle (nesting and wintering) (*Aquila chrysaetos*)BCC, BLMS, ~~CDFG~~CDFW Watch List, ~~CDFG~~CDFW Fully Protected, CDF
- Burrowing owl (burrow sites) (*Athene cunicularia*)BCC, BLMS, SSC
- Western yellow-billed cuckoo (*nesting*) (*Coccyzus americanus occidentalis*)FC, BCC, FSS, SE
- Yellow warbler (nesting) (*Dendroica petechia brewsteri*)SSC
- White-tailed kite (nesting) (*Elanus leucurus*)~~CDFG~~CDFW Fully Protected
- California horned lark (*Eremophila alpestris actia*)~~CDFG~~CDFW Watch List, LAA (full species, coastal slope)
- California condor (*Gymnogyps californianus*)FE, SE, CDF, ~~CDFG~~CDFW Fully Protected, USBC, AWL, ABC
- Yellow-breasted chat (nesting) (*Icteria virens*)SSC
- Loggerhead shrike (nesting) (*Lanius ludovicianus*)BCC, SSC, LAA (coastal slope wintering)
- Coastal California gnatcatcher (*Polioptila californica californica*)FT, SSC, USBC, AWL, ABC
- Bank swallow (nesting) (*Riparia riparia*)ST
- Least Bell's vireo (*Vireo bellii pusillus*)FE, BCC, SE, USBC, AWL, ABC
- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Spotted bat (*Euderma maculatum*)BLMS, SSC, WBWG High
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Silver-haired bat (*Lasionycteris noctivagans*)WBWG Medium

- Western red bat (*Lasiurus blossevilli*)FSS, WBWG High
- Hoary bat (*Lasiurus cinereus*)WBWG Medium
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)SSC
- California leaf-nosed bat (*Macrotus californicus*)FSS, SSC, WBWG High
- South coast marsh vole (*Microtus californicus stephensi*)SSC
- Western small-footed myotis (*Myotis ciliolabrum*)BLMS, WBWG Medium
- Yuma myotis (*Myotis yumaensis*)BLMS, WBWG Low–Medium
- San Diego desert woodrat (*Neotoma lepida intermedia*)SSC
- Southern grasshopper mouse (*Onychomys torridus ramona*)SSC
- Los Angeles pocket mouse (*Perognathus longimembris brevinasus*)FSS, SSC
- American badger (*Taxidea taxus*)SSC

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values.Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE SANTA SUSANA MOUNTAINS AND SIMI HILLS SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	Most of the SEA has critical habitat for the coastal California gnatcatcher.A population of the Braunton's milkvetch has critical habitat in the Simi Hills part of the SEA.The SEA has robust populations of rare plants, such as the Plummer's mariposa lily and the Santa Susana tarweed.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The SEA contains habitat of the extremely rare Santa Susana tarplant.In addition, several plant communities within the SEA are ~~CDFG~~CDFW highest inventory priority communities due to their restricted distribution in the Southern California region.These communities include: coastal sage scrub, alluvial scrub, valley oak woodland, valley oak savannah, mainland cherry woodland, native grassland, southern willow scrub, and cottonwood-willow riparian forest.
	Within the County, biotic communities, vegetative associations,		All of the plant communities and habitats mentioned above as being restricted in distribution on a regional basis are further

Criterion		Status	Justification
C)	and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	restricted in distribution within the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The open space of the SEA allows for connectivity between the Santa Monica Mountains and the San Gabriel Mountains (both the eastern and western sections).Due to the development within the San FernandoValley and the valley of the Santa Clara River, this is an important corridor for gene flow and species movement.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The SEA contains several populations that are unusual or at the extreme ends of their distributions: Douglas-fir, both big cone and the Douglas-fir common to the north, and coastal California gnatcatcher at its western extent.Several unusual vegetation alliances are in the Mountains, for example groves of walnuts and flowering ash.Flowering ash are uncommonly tall.The Santa Susana Mountains contain some representatives of the desert Palmer's oak, which is unusual in the County.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The relatively undisturbed nature and large size of the plant communities within the Santa Susana Mountains and Simi Hills provides many undisturbed examples of native, natural communities within the County.

In conclusion, the area is an SEA because it contains: A) core habitats of listed species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are restricted in distribution in the County and regionally; D) a very essential migration corridor, which is limited in availability in the County; E) unusual populations at the extreme ends of their distributions that are of scientific interest; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Tujunga Valley and Hansen Dam SEA

Location

General

The Tujunga Valley and Hansen Dam Significant Ecological Area (SEA) is located on the northern edge of the San Fernando Valley.The SEA consists of the Tujunga Valley and Wash, starting in the riparian areas of the Big Tujunga, which is the main tributary of the Los Angeles River, within the Angeles National Forest and stretching to include Hansen Dam, Hansen Dam Flood Control Basin, Hansen Dam Park, Hansen Dam Golf Course, Tujunga Wash, and industrial areas downstream of the Hansen Dam. The SEA is entirely in the City of Los Angeles.Most of the part of the SEA upstream, including the Hansen Dam, is a California Audubon-designated State Important Bird Area

(IBA), which is part of the Los Angeles Flood Control Basin IBA.The Big Tujunga area is recognized for its great importance to migrating birds on the Pacific Flyway as well as the very rare habitat of alluvial fan scrub, which has uncommon resident birds.The Tujunga Wash above Hansen Dam and into the AngelesNational Forest beyond the SEA is designated critical habitat for the federally-threatened Santa Ana sucker (*Catastomus santaanae*). Two other fishes of the original native four for the Los AngelesRiver also occur in the Wash and upstream in the Big Tujunga: arroyo chub (*Gila orcuttii*) and an unnamed subspecies of the speckled dace group (*Rhinichthys osculus* ssp. 3).

The SEA is located within portions of the United States Geological Survey (USGS) 7.5' California Quadrangles:San Fernando, Sunland and Van Nuys.

General Boundary and Resources Description

The SEA boundary encompasses the Tujunga Valley Wash and the Hansen Dam Recreation area.The SEA begins in the Angeles National Forest downstream of the confluence of Pipe Canyon with the Big Tujunga, and generally includes the Wash area for much of its extent. The Wash most of the time has water, and from downstream at Hansen Lake (in the Hansen Dam Park) to beyond the upstream area of the SEA, is critical habitat for the federally-threatened Santa Ana sucker (*Catostomus santaanae*).This critical habitat extends beyond the SEA and beyond the Big Tujunga Dam to near the headwaters in both Mill Creek and the Upper Big Tujunga Canyon. The state fish species of concern, speckled dace (*Rhinichthys osculus* ssp. 3) and arroyo chub (*Gila orcuttii*) also occur here. A finger extends off the Wash, up a ridge with native chaparral habitat towards Mount Lukens. The boundary travels east to west, and the Wash receives multiple tributaries from the north and south as it flows west.The northeastern end of the Los Angeles Flood Basins IBA begins at about the crossing of Oro Vista Avenue over the Big Tujunga Wash.The clubhouse part of the Angeles National Golf Club next to Foothill Boulevard is excluded from the SEA, but most of the golfcourse, which has the natural braids of the wash running among its greens, is included in the SEA.East and adjacent to the golf course is a state reserve area for the state and federally-endangered slender-horned spineflower (*Dodecahema leptoceras*).This diminutive wash plant is known locally from Santa Clarita to the east end of the San Bernardino Mountains, and south to the Santa Ana Mountains.It is endangered due to all kinds of development that alters wash flood plains.The golf course area once had and may still have some plants.

The Wash, golf course, and the reserve area have an unusual remnant vegetation of alluvial fan scrub, with California junipers (*Juniperus californica*), cactus patches of prickly-pear (*Opuntia littoralis*) and cholla (*O. parryi*), in conjunction with the usual riparian and scrub plants. The very sensitive coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*) is in residence in this area.The natural area of riparian vegetation is on the banks of the Wash, golf course, and reserve next to the Wash, as well as with a remnant native forest in the stream course of Haines Canyon Creek, which joins the Wash at the golf course.This kind of habitat, which once covered the bajada of coalescing coastal alluvial fans next to the mountains of the County has been nearly extirpated by development and flood control.It is only represented in a few places in the County.The San Gabriel Canyon SEA has another example at the Santa Fe Dam Recreation Area.Migratory waterfowl often use the ponds of the golf course that are filled by Haines Canyon Creek and the Big Tujunga.The alluvial fan habitat mixed with riparian forest continues across the Interstate-210 as the Big Tujunga Wash approaches and flows into Hansen Dam Park.

The SEA has a broad undercrossing of the Interstate-210, which includes a braid of its tributary

Haines Canyon Creek crossing under Foothill Boulevard next to Wentworth Street.The Wentworth Street undercrossing is important to wildlife, as it connects to somewhat dispersed horse ranchettes in the Shadow Hills and from there to the natural areas of the Verdugo Mountains and the Verdugo Mountains SEA.Mountain lions may live in the Verdugo Mountains, which would be an important connection for that population as well as for other animals and plants of the Verdugo Mountains.

The Hansen Dam Park is a meeting area for migratory birds with its perennial water and riparian forest that includes some giant sycamores (*Platanus racemosa*) and cottonwoods (*Populus fremontii*).It is a favorite of bird watchers, and the species list has about 260 species.Unusual species have been observed here, such as the federally-endangered coastal California gnatcatcher (*Polioptila californica californica*).Downstream of the Dam, the Hansen Dam Golf Course is included in the SEA, since the pools and mix of native riparian vegetation along with the ornamental vegetation attracts wildlife.The downstream side of the earthen Hansen Dam has been planted with coastal sage scrub, and may be attractive to the gnatcatcher.The quarry and recharge areas have many spots of willow scrub and occasional other native vegetation.The quarry and the recharge pool areas are included in the SEA up to the undercrossing of San Fernando Boulevard.

The area southwest of the Dam is used as a spreading ground.This has created several freshwater marsh areas that are used by marsh birds, migratory waterfowl, and shore birds.The area is also valuable as a wildlife corridor.The vegetation in the Tujunga Valley runs nearly uninterrupted from the foot of the Verdugo Mountains well up into the San Gabriel Mountains.The area has been recognized for its importance, and is used by the Audubon Society and local universities and colleges as a sample of a rapidly disappearing habitat type.As a result, the resources of the area are well known.

Vegetation

The SEA possesses several important features. The floodplain behind Hansen Dam supports one of the last examples of open coastal sage scrub vegetation that was once found in the numerous arroyos of the Los Angeles Basin.Portions of the river bottom have surface moisture, and support small pockets of fresh water marsh, which is another limited resource in the County.The remainder of the arroyo and surrounding hillsides are dry, and support several species of plants that are otherwise found only on the desert slopes of the San Gabriel Mountains.Populations of Nevin's barberry (*Berberis nevinii*) and slender-horned spineflower have been found in the Tujunga Valley Wash.Both species are extremely limited in distribution and have been placed on the federal endangered species list.

Vegetation within the SEA is comprised of a variety of community types.The diversity of the communities reflects the topography of the area.All plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEA Update Study 2000 Background Report*.Sensitive plant species and plant communities occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA are given below.

Chaparral:A shrub community composed of robust species.Within this SEA, a number of chaparral sub-communities are found, which are differentiated by their dominant plant species.These include

chamise (*Adenostoma fasciculatum*), buck brush (*Ceanothus* spp.), scrub oak (*Quercus berberidifolia*), interior live oak (*Quercus wislizenii*) and mosaics of these depending on mixes of species and elevation.These and other shrub species form dense vegetation covers growing 5 to 10 feet in height.The development of chaparral is pronounced over large hillside areas throughout the SEA.

Corresponding MCV communities:

- *Adenostoma fasciculatum* (chamise chaparral) Shrubland Alliance
- *Adenostoma fasciculatum-Salvia apiana* (chamise-white sage chaparral) Shrubland Alliance
- *Ceanothus greggii* [*vestitus*] (cup leaf ceanothus chaparral) Shrubland Alliance
- *Ceanothus oliganthus* (hairy leaf ceanothus chaparral) Shrubland Alliance
- *Prunus ilicifolia* (holly leaf cherry chaparral)Shrubland Alliance
- *Rhus ovata* (sugarbush chaparral)Shrubland Alliance

Coastal Sage Scrub:Consists of drought-deciduous, low, soft-leafed shrubs and herbs on gentle to steep slopes under 1,500 feet in elevation.This community is dominated by California sagebrush, California buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), purple sage (*Salvia leucophylla*), and California brittle bush (*Encelia californica*).Coastal sage scrub is distributed throughout the SEA along dry ridgelines, slopes, and other areas previously disturbed by fire.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Dendromecon rigida* (bush poppy scrub) Shrubland Alliance
- *Diplacus* [*Mimulus*] *aurantiacus* (bush monkeyflower scrub)Shrubland Alliance
- *Salvia apiana* (white sage scrub) Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance

- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub) Shrubland Alliance

Non-Native Grassland: Consists of dominant invasive annual grasses that are primarily of Mediterranean origin.Dominant species found within this community include wild oat (*Avena fatua*), slender oat, red brome, ripgut brome (*Bromus diandrus*), and herbs such as black mustard and wild radish.Non-native grasslands are located in small to large patches throughout the SEA in previously disturbed areas, cattle pastures, valley bottoms, and along road sides.

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*)Semi-Natural Herbaceous Stands
- *Brassica* (*nigra*)and other mustards Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus*, *hordeaceus*)-*Brachypodium distachyon* Semi-Natural Herbaceous Stands
- *Bromus rubens*-*Schismus* (*arabicus*, *barbatus*)Semi-Natural Herbaceous Stands
- *Lolium perenne* ([*Festuca perennis*] perennial rye grass fields) Semi-Natural Herbaceous Stands

Coast Live Oak Woodland:Dominated by coast live oak (*Quercus agrifolia* var. *agrifolia*) with a poorly developed shrub layer, which may include toyon (*Heteromeles arbutifolia*), golden currant (*Ribes aureum*), laurel sumac (*Malosma laurina*), western blue elderberry (*Sambucus nigra* var. *caerulea*), and mulefat (*Baccharis salicifolia*). Some coast live oak woodlands in the area include scattered Southern California black walnut (*Juglans californica*) or valley oak (*Quercus lobata*). This community occurs throughout the SEA and generally along canyon bottoms and more mesic north-facing slopes.

Corresponding MCV communities:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance

Cottonwood-Willow Riparian Forest:An open broad-leafed winter-deciduous riparian forest dominated by Fremont cottonwood (*Populus fremontii*), arroyo willow (*Salix lasiolepis*), and red willow (*Salix laevigata*).This community occurs in segments along of many of the drainages, ponds, and lakes throughout the SEA.

Corresponding MCV communities:

- *Populus fremontii* (Fremont cottonwood woodlands) Forest Alliance
- *Salix lasiolepis* (arroyo willow thickets) Woodland Alliance
- *Salix laevigata* (red willow thickets) Woodland Alliance

Freshwater Marsh: Small areas supporting freshwater marsh are found at scattered locations.Freshwater marsh requires perennially shallow water or saturated soils.Dominant plants are emergent species including cattails and bulrushes.

Corresponding MCV communities:

- *Phragmites australis* (common reed marshes) Herbaceous Alliance and Semi-Natural Stands
- *Schoenoplectus californicus* (California bulrush marsh) Herbaceous Alliance
- *Typha* (*angustifolia*, *domingenis*, *latifolia*)(cattail marshes) Herbaceous Alliance
- *Lemna* (*minor*) and relatives Provisional (duckweed blooms) Herbaceous Alliance

Disturbed or Barren Areas: Areas that either completely lack vegetation or are dominated by ruderal species. Ruderal vegetation typically found within the SEA include non-native grasses and a high proportion of weedy species, including black mustard and thistle species. Several disturbed areas are scattered throughout the SEA and take the form of residential developments, paved roads, fire breaks, dirt access roads, trails, and other similarly disturbed areas.

Corresponding MCV communities:

No corresponding communities at this time

Wildlife

Wildlife within the SEA is generally diverse and abundant due to large acreages of natural open space and diversity of habitat types.While a few wildlife species are entirely dependent on a single vegetative community, the entire mosaic of all the vegetation communities within the SEA and adjoining areas constitutes a functional ecosystem for a variety of wildlife species, both within the SEA and as part of the regional ecosystem.

The analysis of invertebrates in this study is severely limited due to the lack of data; the SEA, however, undoubtedly supports healthy populations of a diverse assortment of invertebrate species. The native fish populations have been augmented with many additions of non-native fishes from other places, particularly those that are often fished. Amphibian populations are plentiful in the SEA due to the high moisture content provided by freshwater marshes present, as well as the large number of drainages and flood control basin.

The SEA is also likely to support a variety of amphibians within the moister woodland areas and canyon bottoms.Common amphibians to the area are salamanders, Baja California chorus frog (*Pseudacris hypochondriaca*), and California toad (*Anaxyrus halophilus*).Many essential reptilian habitat characteristics are present within the SEA.These include rock outcroppings that allow for high visibility and small mammal burrows for cover and escape from predators and extreme weather.These characteristics, as well as the variety of habitat types present, are likely to support a wide variety of reptilian species.Common reptiles to the area are lizards and snakes. The area southwest of the Dam is used as a spreading ground.This has created several fresh water marsh areas that are used by marsh birds, migratory waterfowl, and shore birds.The many year-round water sources located throughout the SEA provide for abundant raptor foraging, perching, and nesting habitat along the slopes of the San Gabriel and Verdugo Mountain Ranges.

The scrubland, woodland, riparian, and grassland habitats in the SEA provide foraging and cover habitat for year-round residents and seasonal residents.Within the Hansen Dam Recreation Area,

the mammals that are expected to be found are typical of those that would "occur regularly in disturbed areas and the urban edge." These include California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), Virginia opossum (*Didelphis virginiana*), desert cottontail (*Sylvilagus audubonii*), striped and spotted skunks (*Mephitis mephitis and Spilogale gracilis*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), etc.The combination of these resources, as well as the confluence of many community types provides a high diversity of animal species.

Wildlife Movement

Although wildlife movement is hampered by development surrounding the SEA to the south, animals are still able to move through the adjacent hills and valleys, and through the Verdugo Mountains, well up into the San Gabriel Mountains.Due to its large size and topographic complexity, many linkages are certain to occur within the SEA at various bottlenecks.These linkages allow movement between large open space areas within the SEA.Although there are significantly large open spaces within the SEA, contiguous habitat linkages between them are critical in reducing bottlenecks and providing for long-term sustainability.A wide variety of wildlife use linkages throughout the SEA, including mountain lion (*Puma concolor*), coyote, mule deer, bobcat (*Lynx rufus*), and a number of medium-sized mammals.The Wentworth Street underpass of Interstate-210 is a conduit for wildlife through the dispersed residential neighborhoods of the Shadow Hills.The Shadow Hills are the westernmost extent of the Verdugo Mountains, which provide a large area of natural habitat for wildlife.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas."Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species.Most of the stream course of this SEA is critical habitat for the federally-threatened Santa Ana sucker, and also provides habitat for two co-occurring native fish of state concern, the speckled dace and the arroyo chub.

Sensitive Plan Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.The array and composition of these communities has been discussed earlier in this section (see Section 2, Vegetation, above). These communities include chamise-white sage chaparral, holly leaf cherry chaparral, California brittle bush scrub, bush monkeyflower scrub, white sage scrub, and Fremont cottonwood woodlands, which occur throughout the SEA.These communities, or closely

related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Braunton's milk-vetch (*Astragalus brauntonii*)FE, RPR 1B.1
- Nevin’s barberry (*Berberis nevinii*)FE, SE, RPR 1B.1
- Lewis' evening-primrose (*Camissonia lewisii*)RPR 3
- Southern tarplant (*Centromadia parryi* ssp. *australis*)RPR 1B.1
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)FC, SE, RPR 1B.1
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*)RPR 1B.1
- Slender-horned spineflower (*Dodecahema leptoceras*)FE, SE, RPR 1B.1
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)RPR 1B.1
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)RPR 1B.1
- Davidson’s bushmallow (*Malacothamnus davidsonii*)RPR 1B.2
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*)RPR 2.2
- Chaparral ragwort (*Senecio aphanactis*)RPR 2.2
- Greata’s aster (*Symphyotrichum greatae*)RPR 1B.3
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)RPR 1B.2
- Plummer’s mariposa lily (*Calochortus plummerae*)RPR 1B.2
- California satintail (*Imperata brevifolia*)RPR 2.1

Sensitive Animal Species

The following special-status animal species are reported or have the potential to occur within the SEA, based on known habitat requirements and known range attributes:

- California red-legged frog (*Rana draytonii*)FT, SSC
- Western spadefoot (*Spea hammondii*)BLMS, SSC
- Coast Range newt (*Taricha torosa*)SSC
- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- Western pond turtle (*Emys marmorata*)BLMS, FSS, SSC
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Two-striped garter snake (*Thamnophis hammondii*)BLMS, FSS, SSC
- Cooper's hawk (*Accipiter cooperii*)~~CDFG~~CDFW Watch List
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Bell's sage sparrow (*Amphispiza belli belli*) BCC, ~~CDFG~~CDFW Watch List
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)FC, BCC, FSS, SE
- White-tailed kite (*Elanus leucurus*)~~CDFG~~CDFW Fully Protected
- Southwestern willow flycatcher (*Empidonax traillii extimus*)FE, FSS, SE, USBC, AWL, ABC
- California horned lark (*Eremophila alpestris actia*)~~CDFG~~CDFW Watch List, LAA
- Prairie falcon (*Falco mexicanus*)BCC, ~~CDFG~~CDFW Watch List, LAA
- American peregrine falcon (*Falco peregrinus anatum*)BCC, FSS, SE, CDF, ~~CDFG~~CDFW Fully Protected, AWL, ABC
- Coastal California gnatcatcher (*Polioptila californica californica*)FT, SSC, USBC, AWL, ABC
- Least Bell's vireo (*Vireo bellii pusillus*)FE, BCC, SE, USBC, AWL, ABC
- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Spotted bat (*Euderma maculatum*)BLMS, SSC, WBWG High
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High

- Silver-haired bat (*Lasionycteris noctivagans*)WBWG Medium
- Hoary bat (*Lasiurus cinereus*)WBWG Medium
- Western yellow bat (*Lasiurus xanthinus*)WBWG High
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)SSC
- California leaf-nosed bat (*Macrotus californicus*)FSS, SSC, WBWG High
- San Diego desert woodrat (*Neotoma lepida intermedia*)SSC
- Big free-tailed bat (*Nyctinomops macrotis*) SSC, WBWG Medium-High
- Southern grasshopper mouse (*Onychomys torridus ramona*)SSC
- Los Angeles pocket mouse (*Perognathus longimembris brevinasus*)FSS, SSC
- American badger (*Taxidea taxus*)SSC
- Santa Ana sucker (*Catostomus santaanae*) FT, SSC
- Arroyo chub (*Gila orcuttii*) SSC
- Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3) SSC

Regional Biological Value

The SEA meets all SEA designation criteria and supports many regional biological values.Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE TUJUNGA VALLEY AND HANSEN DAM SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	The Tujunga Valley Wash supports populations of the federally-endangered plants Nevin's barberry and slender-horned spineflower.Most of the SEA is critical habitat for the federally-threatened Santa Ana sucker.Two other sensitive native fishes, speckled dace and arroyo chub, co-occur with the sucker.Coastal California gnatcatcher may be a resident of the area.The coastal cactus wren nests in the alluvial fan vegetation of the SEA.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The stream is naturally perennial, but largely controlled by the upstream Big Tujunga Dam.Similar wash and floodplain habitat of these plants and fishes is under considerable pressure from development and from flood-control hard channelization throughout Southern

			California.The rarity of the vegetation extends to other biota that use these areas, and these plants are indicators for a widespread loss of this kind of habitat.Several birds considered species of special concern occur in the SEA.They typically occupy alluvial scrub areas ,such as the outwash fans formerly found where mountain canyons exit onto the plain of the Los Angeles Basin, and are in this habitat in the SEA.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Met	The wash and floodplain habitat of these plants, fishes, and birds is under considerable pressure from development and for flood-control hard channelization throughout Los Angeles and is much diminished from the continuous habitat it once was.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	This SEA is located on one of the main tributaries of the Los Angeles River, Tujunga Canyon and connects with the Hansen Dam flood and recharge area.In spite of the channelization of the Los Angeles River, this area is still an important connecting and migration area for plants and wildlife between the San Gabriel Mountains, the Verdugo Mountains, and the San Fernando Valley.It is an important rest area for aerial fauna traveling between the Santa Monica Mountains and the San Gabriel Mountains.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The scarcity of natural alluvial wash and fan habitats in Los Angeles ensures that the remaining ones are good areas for scientific study of birds and other organisms that were once more common in the Los Angeles area.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The Tujunga Valley Wash is a relatively undisturbed example of the alluvial washes and fans that once lined the mountains of Los Angeles.It is near a fresh water marsh area used as a spreading ground that is southwest of the dam.A fresh water marsh near the stream exit from the mountains would have been typical of the former configuration with faults along the mountain base, creating uneven ground that would contain marsh pockets.Now most of this type of area has been developed for residences, and most of the washes have been altered as flood control projects. The Wash, therefore, is important to preserve.

In conclusion, the area is an SEA because it contains:A) the habitat of core populations of endangered and threatened plant and animal species; B-C), biotic communities, vegetative associations, and habitat of plant or animal species that are restricted in distribution on a regional basis and limited in availability in the County;D) habitat for breeding, feeding, resting, and migrating that is limited both in the County and regionally;E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in theCounty.

Valley Oaks Savannah SEA

Location

General

The Valley Oaks Savannah Significant Ecological Area (SEA) is located north of the Santa Susana Mountains, approximately one mile south of the Santa Clara River and one mile north of Pico Canyon.The SEA is bordered on the east by Interstate-5 and is situated between Valencia Boulevard and Stevenson Ranch Parkway.To the west, the SEA is bordered by the foothills of the Santa Susana Mountains.The habitat within the SEA was once the emblem of Spanish California, with rolling hills, grasslands and spaced giant valley oaks.This was a chief habitat in the San Fernando Valley when it was filled with wildlife, such as herds of pronghorn.Under the influence of European settlers, these areas were at first cattle range, and then gradually developed into residential neighborhoods.

The SEA is located in the Newhall United States Geological Survey (USGS) 7.5' California Quadrangle.

General Boundary and Resources Description

The SEA is bordered to the east by Interstate-5 and is situated between Valencia Boulevard on the north and Stevenson Ranch Parkway on the south of the SEA.To the west, the SEA is bordered by the West Ridge residential area of Valencia to the north, and the foothills of the Santa Susana Mountains to the south.The SEA boundary outlines an irregular area of undisturbed grassland savannah with hundreds of valley oaks (*Quercus lobata*).In the north, the SEA includes a small part of the TPC of Valencia (a private golf club) that has retained a number of its valley oaks on the ridges between sections of the golf course.The topography is rolling ridges that trend northeast-southwest along the edge of development.The West Ridge development is on graded areas of those rolling ridges.

The SEA is almost completely undisturbed, except for a few dirt roads.This area contains one of the last remaining stands of valley oak (*Quercus lobata*) in the Santa Clarita Valley.The site consists of specimen trees scattered over the SEA.The adjoining natural hills to the southwest of the SEA have a mixture of plants from the coastal sage chaparral scrub and chaparral communities, which are typical of those found in the Santa Clarita Valley.Other vegetation on the SEA in the southwest area includes coastal sage chaparral scrub and non-native grasses.

The majority of the SEA consists of undisturbed open space bordered by a few high density residential developments.Open space that adjoins the SEAto the southwest is mostly vegetated with dense stands of chaparral.Other types of vegetation, such as woodlands and grasslands, occur in smaller portions that are scattered throughout the adjacent land on moist or north-facing slopes and canyon bottoms.Lesser amounts of coastal sage chaparral scrub are also present, chiefly as an early successional community in areas that have been previously disturbed.

Vegetation

All plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEA Update Study 2000*

Background Report.More recent survey findings have also been reviewed here in order to reflect the current status of the area. Findings from the Santa Clarita Valley Area Plan, Los Angeles Department of Regional Planning, 2010 have been reviewed and included. Sensitive plant species and plant communities occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA are given below.

Valley Oak Savannah:An open-canopy woodland found on deep, well-drained alluvial soils below 2,000 feet.This community is almost exclusively dominated by valley oak with scattered coast live oaks (*Quercus agrifolia* var. *agrifolia*) in some areas and a grassy understory of California buckwheat, forming a savannah-like community throughout much of the SEA.

Corresponding MCV communities:

- *Quercus lobata* (valley oak woodland) Woodland Alliance

Coastal Sage Chaparral Scrub Communities:Consist of drought-deciduous, low, soft-leaved shrubs and herbs on gentle to steep slopes under 3,000 feet in elevation.Several dominant species may occur within scrub communities, with some areas overwhelmingly dominated by one or two species.Dominant species include California sagebrush, California buckwheat, California brittle bush (*Encelia californica*), purple sage (*Salvia leucophylla*), bush mallow (*Malacothamnus fasciculatus*), Menxie's goldenbush (*Isocoma menziesii*), and deer weed (*Acmispon glaber*).

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Dendromecon rigida* (bush poppy scrub) Shrubland Alliance
- *Isocoma menziesii* (Menzie's golden bush scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub) Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance

- *Ericameria linearifolia* (narrowleaf goldenbush scrub) Provisional Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub) Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub) Shrubland Alliance

Grassland Communities:Consist of low, herbaceous vegetation dominated by grasses, but generally also harbor native forbs and bulbs, as well as naturalized annual forbs.Non-native grassland consists of dominant invasive annual grasses that are primarily of Mediterranean origin.Dominant species found within this community include wild oat, slender wild oat, foxtail chess, ripgut brome, along with scattered coastal sage chaparral scrub species.Non-native grasslands occur along the western portion of the north boundary of the SEA.

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*)Semi-Natural Herbaceous Stands
- *Brassica* (*nigra*)and Other Mustards Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus*,*hordeaceus*)-*Brachypodium distachyon* Semi-Natural Herbaceous Stands
- *Bromus rubens-Schismus* (*arabicus*, *barbatus*) [*Bromus madritensis* ssp. *rubens*]Semi-Natural Herbaceous Stands
- *Lolium perenne* [*Festuca perennis*] (perennial rye grass fields) Semi-Natural Herbaceous Stands

Disturbed or Barren Areas: Areas that either completely lack vegetation or are dominated by ruderal species.Ruderal vegetation typically found within the SEA include non-native grasses and a high proportion of weedy species, including black mustard and thistle species.The primary disturbed areas within the SEA are dirt roadways.

Corresponding MCV communities:

None at this time.

Wildlife

Wildlife populations within the SEA are limited in diversity due to the area's physiographic size and its nearly complete surrounding by development.While a few wildlife species are entirely dependent on a single vegetative community, the entire mosaic of all the vegetation communities within the SEA and adjoining areas constitutes a functional ecosystem for a variety of wildlife species, both within the SEA and as part of the regional ecosystem.

The analysis of invertebrates is severely limited due to the lack of specific data; however, the SEA is likely to support small healthy populations of invertebrate species based on its undisturbed nature and type of habitat.Acorns within the Valley Oak Savannah provide a valuable food source for a variety of wildlife.Also, the mature trees are an important source of nesting and roosting habitat for birds and other arboreal vertebrates.The scrubland, woodland, and grassland habitats in and

adjacent to the SEA provide foraging and cover habitat for year-round residents, seasonal residents, and migrating song birds.In addition, the SEA contains abundant raptor foraging, perching, and nesting habitat.Mammal populations within the SEA respond favorably to these habitats.Although mammal populations within the SEA are expected to be limited due to the size of the SEA, they are still likely to utilize the area based on the habitats present.Amphibians may not be abundant due to the lack of water in the SEA; however, shaded areas within the woodland may be moist enough to allow for a few species to occupy the site.Reptilian diversity within the SEA is highest within patches of coastal sage chaparral scrub and may be abundant due the presence of alluvial wash habitat on adjacent property.

Wildlife Movement

Wildlife movement within the SEA is limited to local movement of foraging animals.Although the SEA does not support regional corridors itself, adjacent lands to the west and northwest may be important linkages for wildlife movement to and from the Santa Susana Mountains and the Santa Clara River.The location of the SEA, therefore, may be important as a corridor buffer and/or adjacent foraging grounds.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition.

Sensitive Plan Communities and Habitats

The SEA supports four plant community types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.These communities include valley oak woodland, California brittle bush scrub, white sage scrub, and narrowleaf goldenbush scrub.The valley oak woodland occupies the majority of the SEA, and the remaining alliances occur in the southwestern part of the SEA.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a

decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Peirson's morning-glory (*Calystegia peirsonii*)RPR 4.2
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)RPR 1B.1, SE, federal candidate (FC)
- Short-joint beavertail (*Opuntia basilaris* var. *brachyclada*)RPR 1B.2
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*)RPR 2.2
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)RPR 1B.2
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2

Sensitive Animal Species

The following special-status animal species are reported or have the potential to occur within the SEA, based on known habitat requirements and known range attributes:

- Western spadefoot (*Spea hammondii*)BLMS, SSC
- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- Rosy boa (*Charina trivirgata*)BLMS, FSS
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Cooper's hawk (*Accipiter cooperii*)~~CDFG~~CDFW Watch List
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Grasshopper sparrow (*Ammodramus savannarum*)~~CDFG~~CDFW Special Animals List
- Bell's sage sparrow (*Amphispiza belli belli*)BCC, ~~CDFG~~CDFW Watch List
- Burrowing owl (*Athene cunicularia*)BCC, BLMS, SSC
- White-tailed kite (*Elanus leucurus*)~~CDFG~~CDFW Fully Protected
- California horned lark (*Eremophila alpestris actia*)~~CDFG~~CDFW Watch List, LAA
- Loggerhead shrike (*Lanius ludovicianus*)BCC, SSC, LAA

- Coastal California gnatcatcher (*Polioptila californica californica*)FT, SSC, USBC, AWL, ABC
- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Spotted bat (*Euderma maculatum*)BLMS, SSC, WBWG High
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Hoary bat (*Lasiurus cinereus*)WBWG Medium
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)SSC
- California leaf-nosed bat (*Macrotus californicus*)FSS, SSC, WBWG High
- San Diego desert woodrat (*Neotoma lepida intermedia*)SSC

Regional Biological Value

The SEA meets all SEA designation criteria and supports many regional biological values.Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE VALLEY OAKS SAVANNAH SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	The County considers oaks as indicators of the presence of important biological communities for preservation, and the uncommon valley oaks of the western areas of the County are especially valued.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The County has the southern boundary of occurrence for the valley oak, which has its core population in the California Central Valley.This makes the valley oak areas important forSouthern California—they are very uncommon for the region as a whole.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The valley oak is uncommon in the County, and the western areas with this species are scattered.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating	Met	Oaks are the basic structure for complex communities of organisms.They form shelter and provide many ecosystem functions that facilitate breeding, feeding, resting, and migration.As the basis of the community, it is important to conserve this habitat.

Criterion		Status	Justification
	grounds and is limited in availability either regionally or in the County.		
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The valley oaks of the County are on the southern edge of the species' range.This makes them important as the extreme in physical and geographical limits for the scientific study of the species.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Although the SEA area is small, this savannah is natural and representative of a natural biotic community that has chiefly been lost in the County.

In conclusion, the area is an SEA because it contains:A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community; and F) a natural savannah of valley oaks, once a common habitat on the west side of the County.

Verdugo Mountains SEA

Location

General

The Verdugo Mountains Significant Ecological Area (SEA) is located within the Verdugo Mountains.This SEA encompasses the Verdugo Mountains south of Interstate-210 and east of the Interstate-5, as well as a portion of these mountains north of Interstate-210.

The Verdugo Mountains are a wilderness island in the middle of the urbanized metropolitan area of the County, surrounded by the cities of Los Angeles, Burbank and Glendale.This area is cherished by the local communities, much of which are designated agricultural with many equestrian properties.The Verdugo Mountains have retained a rural atmosphere despite their proximity to urban Los Angeles.The Verdugo Mountains currently encompass wilderness area, which ranges through various chaparral, coastal sage chaparral scrub, southern willow scrub, coast live oak woodland and forest ecosystems, and many riparian areas with seasonal waterfalls.It is one of the few remaining natural regions in the Los Angeles area that supports abundant native wildlife and habitats, and also contains several rare and sensitive plant and animal species.The geographic location of the Verdugo Mountains makes them

important for scientific study, genetic interchange between otherwise isolated populations, and recreation for urban residents.

The SEA is located at least partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles:Burbank, Sunland, and Pasadena.

General Boundary and Resources Description

The SEA is an island refuge, providing what remains of a link between plant and animal populations found in the Santa Monica and San Gabriel mountains.Genetic interchange, by way of this linkage is important in perpetuating the genetic variability in isolated populations, and the maintenance of healthy ecosystems.Chaparral and coastal sage chaparral scrub cover the hillsides of the mountains, with lush riparian vegetation, including California bay (*Umbellularia californica*), western sycamore (*Platanus racemosa*), coast live oak (*Quercus agrifolia* var. *agrifolia*), ferns, and ocellated Humboldt lily (*Lilium humboldtii* ssp. *ocellatum*), which are found in most of the stream drainages.These plant communities provide habitat that is essential to the diverse and abundant fauna that are found in the area.The mountains are also home to the northernmost population of mission manzanita (*Xylococcus bicolor*).

The proximity of the mountains to urban areas provides an excellent opportunity to study the interaction between wild animal populations and humans.The area has already been used for studies concerned with public health.The Interstate-210 crosses the northern edge and there is some intrusion of development along La Tuna Canyon Road. Residential development is beginning to trim the area and has been excluded from the SEA. However, present human use of the natural, native area has been low and has not significantly affected the natural resources found in the Verdugo Mountains.

The northernmost point of the SEA is in the Shadow Hills district of the City of Los Angeles at the west side of the undercrossing of Sunland/Foothill Boulevard beneath the Interstate-210. The freeway frontage is native vegetation and connective to the north with the Wentworth Streetundercrossing ofInterstate-210.The connection is through native vegetation along the freeway frontage and among dispersed equestrian ranchettes in the Shadow Hills.Wentworth Street ends a short distance east of Interstate-210 at the Angeles National Golf Club, which has its greens interspersed among braided stream courses of the Big Tujunga Canyon alluvial fan. The golf course is part of the SEA.The native vegetation along the freeway, at the restored County Public Works area on the north side of Wentworth, and the native vegetation among the residences of Shadow Hills is all considered an important conduit for wildlife traversing among the San Gabriel Mountains, the SEA, and the Verdugo Mountains.

The SEA boundary follows southward along the southwest side of the Interstate-210 for about a half mile and then crosses to the northeast side of Interstate-210, along a ridge that connects to slopes with natural, native habitat that continues east, along the southern border of the communities of Sunland and Tujunga.In the vicinity of Pasko Peak, the SEA border is drawn around development in the southern edge of the community of Tujunga.The SEA border recrosses the Interstate-210 and then La Tuna Canyon Road.The crossing boundary goes along the east side of a northern tributary of La Tuna Canyon.

A paved road goes along the streamcourse in La Tuna Canyon, and the SEA includes about two miles of native, natural vegetation bordered on the eastern, undeveloped section of the road.The developed western end of La Tuna Canyon Road is excluded from the SEA in a “cherry stem” configuration.

After crossing Interstate-210 and La Tuna Canyon Road, the SEA tracks the southern side of natural habitat along the Interstate-210 for about a mile. The boundary trends irregularly southeast excludingdevelopment in the flatter areas that border the Verdugo Wash in the Verdugo City District of Glendale. The SEA includes the incised canyons of Sheep Corral, Cunningham, Henderson, Engleheard, and unnamed others, which are all tributaries of the channelized Verdugo Wash.

In the relatively narrowed area around the State Route-2 (Verdugo Canyon) between the San Rafael Hills on the west and the Verdugo Mountains on the East, the SEA continues irregularly south along the natural, native vegetation of the steep hillsides of the Verdugo Mountains that border Glendale.The SEA includes many unnamed canyons and also Ayars Canyon and Deer Creek at the end of Beaudry Boulevard.The unnamed canyon north of Dead Horse Canyon has a possible wildlands connection with the San Rafael Hills.Its northeast-facing slope along Sunshine Drive has chiefly native vegetation and ends in the Verdugo Park on Verdugo Boulevard.Across Verdugo Boulevardis Glendale Community College.The College's eastern border is a natural ridge that connects with the Mountain Avenue overpass of State Route-2 and native vegetation of the San Rafael Hills.Verdugo Boulevard and its development is a substantial block to terrestrial wildlife movement, but aerial fauna and plant seeds can connect fairly easily along this path.In the vicinity of Dead Horse Canyon, the SEA boundary turns generally westward and proceeds irregularly around development in Glendale, including natural parts of Toll, Hillcrest, Sherer, Idelwood, Pomeroy, Brand, and Childs canyons.

The lobe of the Verdugo Mountains between Hillcrest and Brand canyons is the area with the shortest possible traverse, which is a little less than two miles, to the Santa Monica Mountains in Griffith Park. Aerial fauna and plant seeds can easily make the journey, and the Los Angeles River channel at the base of the Santa Monica Mountains has developed a natural bottom and riparian habitat that must be inviting to migrants.A city park and a cemetery are on the route. The Verdugo Mountains are often viewed as one of the principle connections between the Santa Monica Mountains and the San Gabriel Mountains.However, it must be noted that this corridor is highly fragmented and probably impassable for most terrestrial wildlife.

Curving to the northwest in Burbank, the SEA boundary includes the natural, native vegetation of Elmwood, Story, Deer, and Sunset canyons. Sunset Canyon excludes a cherry-stem shaped area around adevelopment. The Wildwood Canyon Park is included in the SEA with its many stately sycamore and coast live oak trees along the narrow stream course.In Stough Canyon the DeBell Municipal Golf course is excluded, as is the paved section of Stough Canyon Road and the buildings of the Stough Canyon Nature Center;however, the hillsides around Stough Canyon Road are included with a lobe of the SEA including the west ridge of Stough.On the west side of this ridge are the excluded Starlight Bowl and a nearby landfill.Continuing northwest, the SEA includes the natural, undeveloped uppermost elevations ofMcClure, Brace, Cabrini canyons in Burbank, andFisher, Jeffries, and Chandler canyons of Sun Valley.

North of Chandler is the developed south side of La Tuna Canyon Road, where the SEA boundary turns west along natural vegetation, using lot lines in part, which delineate the extent of fuel modification in this area of high fire hazard. The SEA boundary includes the north-facing south side of La Tuna Canyon for a distance of about three miles.The boundary crosses the road at the point where development stops and natural vegetation is on both sides of the road.From this point, the boundary continues the cherry-stem exclusion westward along the border of natural vegetation on the south-facing slope of La Tuna Canyon.Near the northwestern end of the Verdugo Mountains and La Tuna Canyon, the La Tuna stream joins the West Burbank Flood Control Channel. The SEA boundary includes the McDonald

Creek drainage (tributary of La Tuna) and loops around the north ridge of McDonald Creek, changing direction to the northeast.The SEA boundary includes the natural area along the northern edge of the Verdugo Mountains by again following the edge of development in the Shadow Hills district of the City of Los Angeles. The boundary joins the northernmost point of the SEA near the undercrossing of Interstate-210 for Sunland/Foothill Boulevard.

The SEA is wholly within incorporated boundaries (cities of Los Angeles, Glendale, and Burbank), but much is preserved in conservation easements under the guidance of the Santa Monica Mountains Conservancy.

Vegetation

Vegetation within the SEA is comprised of a large variety of community types.The diversity of the communities reflects the topography of the Verdugo Mountains.The southern slopes are affected by moist marine weather conditions, while the northern slopes are influenced by drier inland weather conditions.In addition, the steepness of many slopes causes sharp differences in vegetation on either side of a ridge.All plant species observed or recorded in previous documentation within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEA Update Study 2000 Background Report* and other analyses conducted for this area.Sensitive plant species and plant communities occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the SEA are given below.

Chaparral:A shrub community composed of robust species.Within this SEA, a number of chaparral subcommunities are found, and differentiated by their dominant plant species.These include chamise (*Adenostoma fasciculatum*), buck brush (*Ceanothus* spp.), scrub oak (*Quercus berberidifolia*), coast live oak (*Quercus agrifolia* var. *agrifolia*) and mosaics of these, depending on mixes of species and elevation.These and other shrub species form dense vegetation covers growing 5 to 10 feet in height.The development of chaparral is pronounced over large hillside areas throughout the SEA.

Corresponding MCV communities:

- *Adenostoma fasciculatum* (chamise chaparral) Shrubland Alliance
- *Adenostoma fasciculatum-Salvia apiana* (chamise-white sage chaparral) Shrubland Alliance
- *Arctostaphylos glauca* (bigberry manzanita chaparral) Shrubland Alliance
- *Ceanothus greggii* [*vestitus*](cup leaf ceanothus chaparral) Shrubland Alliance
- *Ceanothus leucodermis* (chaparral whitethorn) Shrubland Alliance
- *Ceanothus oliganthus* (hairy leaf ceanothus chaparral) Shrubland Alliance
- *Prunus ilicifolia* (olly leaf cherry chaparral)Shrubland Alliance

Coastal Sage Chaparral Scrub: A shrubland community exhibiting less robust structure found in this SEA is coastal sage chaparral scrub.This plant community is dominated by California sagebrush (*Artemisia tridentata*), California brittle bush (*Encelia californica*), black sage (*Salvia mellifera*), and California buckwheat (*Eriogonum fasciculatum*).It also forms dense stands, which grow three to four feet in height.Within this SEA, it is generally found in scattered patches, which are highly integrated with mixed chaparral.These are primarily located in the lower elevation hillsides of the SEA.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub) Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub) Shrubland Alliance

Coast Live Oak Woodland:A plant community dominated by *Quercus agrifolia.*Within the SEA, this community includes coast live oak, which typically grows to heights of 20 to 40 feet, and forms either closed or open tree canopies.Oak woodland is most commonly found on north-facing slopes and in drainage bottoms and often intergrades with shrub communities.Understory vegetation varies from grassland in level areas to shrubs where topography is steeper.

Corresponding MCV community:

- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance

Southern Willow Scrub:Found along widely scattered reaches of several drainages throughout this SEA.This community is dominated by species of willow (*Salix* spp.), which form nearly monotypic stands due to their dense growth, with an occasional cottonwood.These stands generally reach 10 to 20 feet in height with little understory vegetation.

Corresponding MCV communities:

- *Salix lasiolepis* (arroyo willow thickets) Shrubland Alliance

Riparian Forest: Along the major drainages, riparian forest is found.Typically, riparian forest grows along streams in bedrock-constrained, steep-sided canyons, resulting in a fairly narrow riparian corridor. The specific dominant plants are not known, but riparian trees such as California bay (*Umbellularia californica*), white alder (*Alnus rhombifolia*), coast live oak, western sycamore

(*Platanus racemosa*) and willow occur. There are also a greater number of hydrophytic (moister favoring) plant species in the understory.

Corresponding MCV communities:

- *Alnus rhombifolia* (white alder groves) Forest Alliance
- *Umbellularia californica* (California bay forest) Forest Alliance
- *Quercus agrifolia* (coast live oak woodland) Woodland Alliance
- *Platanus racemosa* (California sycamore woodlands) Woodland Alliance

Wildlife

Wildlife within the SEA is generally diverse and abundant due to large acreages of natural open space and diversity of habitat types.While a few wildlife species are entirely dependent on a single vegetative community, the entire mosaic of all the vegetation communities within the SEA and adjoining areas constitutes a functional ecosystem for a variety of wildlife species, both within the SEA and as part of the regional ecosystem.

The analysis of invertebrates is severely limited due to the lack of data; the SEA, however, undoubtedly supports healthy populations of a diverse assortment of invertebrate species.Amphibian populations are plentiful in the SEA due to the high moisture content provided by coastal conditions, as well as the large number of drainages and year-round water supplies.The SEA is also likely to support a variety of amphibians within the moister woodland areas and canyon bottoms.Many essential reptilian habitat characteristics are present within the SEA.These include rock outcroppings that allow for high visibility and small mammal burrows for cover and escape from predators and extreme weather.These characteristics, as well as the variety of habitat types present, are likely to support a wide variety of reptilian species.

The scrubland, woodland, riparian, and grassland habitats in the SEA provide foraging and cover habitat for year-round residents, seasonal residents, and migrating song birds.In addition, the SEA encompasses many year-round water sources that are located throughout the SEA and abundant raptor foraging, perching, and nesting habitat along the northern slopes of the Verdugo Mountains.The combination of these resources, as well as the confluence of many community types provides an unusually high diversity of bird species.Mammal populations within the SEA are diverse and reflective of the large size and variation of topography and community types.

All wildlife species previously recorded, as well as those expected to occur, within the SEA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEA Update Study 2000 Background Report*.Sensitive wildlife species occurring or potentially occurring within the SEA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

Although wildlife movement is hampered by adjacent rural development in proximity to the SEA, animals are still able to move through the Verdugo Mountains in many areas.Due to its large size and topographic complexity, many linkages occur within the SEA at various bottlenecks.These

linkages allow movement between large open space areas within the SEA, as well as between areas outside the SEA toward the Angeles National Forest.The genetic flow through these areas is crucial in maintaining the diversity and viability of the species within the Verdugo Mountains. Some areas of probable, possible, and perhaps future connection have been indicated in the General Boundary and Resources section.Although there are significantly large open spaces within the SEA, contiguous habitat linkages between them is critical in reducing bottlenecks and providing for long-term sustainability.A wide variety of wildlife use linkages throughout the SEA, including mountain lion (*Puma concolor*), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), bobcat (*Lynx rufus*), as well as a number of medium-sized mammals.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare.This is due to the species' declining or limited population sizes, which usually results from habitat loss.Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS).The following sections indicate the habitats as well as plant and animal species present, or potentially present within the SEA, which have been accorded special recognition.

Sensitive Plan Communities and Habitats

The SEA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011].The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species.These communities include chamise-white sage chaparral, holly leaf cherry chaparral, California brittle bush scrub, California bay forest, and California sycamore woodlands, which occur throughout the SEA.These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system.The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution).In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*)RPR 2.2

- Nevin's barberry (*Berberis nevinii*)FE, SE, RPR 1B.1
- Lewis' evening-primrose (*Camissonia lewisii*)RPR 3
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)FC, SE, RPR 1B.1
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*)RPR 1B.1
- Peruvian dodder (*Cuscuta obtusiflora* var. *glandulosa*)RPR 2.2
- Palmer's grapplinghook (*Harpagonella palmeri*)RPR 4.2
- Davidson's bushmallow (*Malacothamnus davidsonii*)RPR 1B.2
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*)RPR 2.2
- Greata's aster (*Symphyotrichum greatae*)RPR 1B.3
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)RPR 1B.2
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2
- California sawgrass (*Cladium californicum*)RPR 2.2
- California satintail (*Imperata brevifolia*)RPR 2.1
- Ocellated Humboldt lily (*Lilium humboldtii* ssp. *ocellatum*)RPR 4.2

Sensitive Animal Species

The following special-status animal species are reported or have the potential to occur within the SEA, based on known habitat requirements and known range attributes:

- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- Rosy boa (*Charina trivirgata*)BLMS, FSS
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)~~CDFG~~CDFW Watch List
- Bell's sage sparrow (*Amphispiza belli belli*)BCC, ~~CDFG~~CDFW Watch List
- Southwestern willow flycatcher (*Empidonax traillii extimus*)FE, FSS, SE, USBC, AWL, ABC
- Least Bell's vireo (*Vireo bellii pusillus*)FE, BCC, SE, USBC, AWL, ABC

- Pallid bat (*Antrozous pallidus*)FSS, BLMS, SSC, WBWG High
- Western mastiff bat (*Eumops perotis californicus*)BLMS, SSC, WBWG High
- Silver-haired bat (*Lasionycteris noctivagans*)WBWG Medium
- Hoary bat (*Lasiurus cinereus*)WBWG Medium
- Western yellow bat (*Lasiurus xanthinus*)WBWG High
- Big free-tailed bat (*Nyctinomops macrotis*)SSC, WBWG Medium-High
- American badger (*Taxidea taxus*)SSC

Regional Biological Value

The SEA meets all SEA designation criteria and supports many regional biological values.Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE VERDUGO MOUNTAINS SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	NotMet	No critical habitats are designated within this SEA.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The Verdugo Mountains combined is an extensive, relatively undisturbed island of natural vegetation in an urbanized area, which is very rare in Southern California.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Met	The Verdugo Mountains combined is an extensive, relatively undisturbed island of natural chaparral and canyon vegetation. It is an important island refuge for migration among the mountain ranges of the northern portion of the County.Aerial animals and plant seeds can easily traverse the distances between the Verdugo Mountains and Santa Monica, Santa Susana, and the San Gabriel mountains.The Verdugo Mountains serve as the centerpiece of these connections.The hillsides are covered by chaparral and coastal sage chaparral scrub.The canyons' riparian vegetation includes California bay, sycamores, ferns and tiger lilies.These plant communities provide habitat that is essential to the diverse and abundant fauna found in the area.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is	Met	The Verdugo Mountains serve asan arm of the San Gabriel Mountains, extending towards the eastern end of the Santa Monica Mountains in Griffith Park—only two miles distant.Aerial animals and plant seeds easily cross

	limited in availability either regionally or in the County.		the gap.The Verdugo Mountains are exceedingly important for connections among the Santa Monica, Santa Susana, and the San Gabriel mountains.Genetic interchange, by way of this linkage, is important in perpetuating the genetic variability in isolated populations, which maintains healthy ecosystems and resilience to climate change.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The geographic location of the Verdugo Mountains makes them important for scientific study, genetic interchange between otherwise isolated populations, and recreation for urban residents.The area has already been used for studies concerned with public health.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The Verdugo Mountains have been impacted by dirt roads, one paved road in Tuna Canyon, fuel breaks, transmission lines and isolated buildings for houses, radio towers, and water tanks.Because of their extent, however, the Verdugo Mountains are still consideredlargely natural and little impacted—a prime example of the chaparral and coastal sage chaparral scrub once prevalent in the County coastal areas.

In conclusion, the area is an SEA because it contains:B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

SEA DESCRIPTION SOURCES

Altadena Foothill and Arroyo SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti(editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded*. Second Edition. Jepson Herbarium, Berkeley, CA. 1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals* (*898 taxa*). 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants, Bryophytes, and Lichens List.* Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

County of Los Angeles, Department of Regional Planning. 2006. *The Altadena SEA Update Study,* Los Angeles County, California.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Los Angeles County, Department of Parks and Recreation. Date unknown. *Bonelli Regional Park Bird List*, San Dimas, California.

Quinn, R.P. Date unknown. *The Status of Walnut Forests and Woodlands* (*Juglans californica*) *in Southern California*, Department of Biological Sciences, California State Polytechnic University, Pomona, California.

Sawyer, Keeler-Wolf and Evens. 2009. A Manual of California Vegetation, Second Edition Sacramento: California Native Plant Society Press.

Toyon Design, Landscape Architecture. August 5, 2004. *Biological Survey and Habitat Needs Analysis for the Altadena Foothills, Los Angeles County, CA*. Prepared for the Altadena Foothills Conservancy

Antelope Valley SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded*.Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals (898 taxa).* 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants, Bryophytes, and Lichens List.*Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

CalMat Properties Co.1988.*A Plan for Reclamation:Big Rock Creek, Attachment:Technical Supplement, SEA No. 48,* Los Angeles County, California.

County of Los Angeles, Department of Regional Planning.2006.*The Antelope Valley SEA Description,* Los Angeles County, California.

County of Los Angeles, Department of Regional Planning.1994.*Mescal Creek Surface Mining and Reclamation Plan, Preliminary Draft Environmental Impact Report,* Los Angeles County, California.

Edwards Air Force Base.1999.Checklist of Birds.Two page leaflet.

Envicom Corporation.1999.*Biological Constraints Analysis for 4 Aces FilmLocations Property, SEA Nos. 48 & 53,* Los Angeles County, California.

Fishman, R.1988.*Biological Survey and Impact Assessment for Tentative Parcel No. 19426, 150th St. East and Avenue O, Lake Los Angeles, SEA No. 53 (revised),* Los Angeles County, California.

Fishman, R.1988.*Biological Survey and Impact Assessment for Tentative Parcel No. 19426, 150th*

St. East and Avenue O, Lake Los Angeles, SEA No. 53, Los Angeles County, California.

Frank Hovore & Associates.2000.*County of Los Angeles Biological Constraints Analysis, Birsner Property*, Crystalaire, P.M. 25189.

Frank Hovore & Associates.2000.*Antelope Valley Courthouse Site, Biological Impacts Assessment*.

Frank Hovore & Associates.1996.Palmdale Water District, *1996 Water System Master Plan, Biological Constraints Assessment*.

Furgo-McClelland (West), Inc.1992.*Draft Biota Report for Surface Mining Permit 90296, SEA No. 55, Mescal Creek (revised),* Ventura, California.

Furgo-McClelland (West), Inc.1992.*Draft Biota Report for Surface Mining Permit 90296, SEA No. 55, Mescal Creek,* Ventura, California.

Hanes, T. and J. Weintraub.1989.*Biota and Project Plans for Tentative Tract No. 40248, Puzzle/Jesus Creek Area, SEA No. 55,* Pearblossom, California.

Hanes, T. and J. Weintraub.1988.*Biological Survey of a 380 Acre SEA, Puzzle/Jesus Creek Area, SEA No. 55,* Pearblossom, California.Department of Biology, Cal State Univ. Fullerton.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Impact Sciences, Inc.1992.*Biota Report for Tentative Tract Map 50804, SEA Nos. 48 and 53,* Los Angeles County, California.

Impact Sciences, Inc.1991.*Biological Constraints Analysis for Lake Los Angeles Site, SEA Nos. 51-54,* Los Angeles County, California

Mattoni, R.Butterflies of Greater Los Angeles.Wall poster, 2 sides.

Michael Brandman Associates.1989.*Biological Resources Assessment, Assessor's Parcel No. 3029-12-08, SEA No. 53*, Los Angeles County, California.

Michael Brandman Associates.1989.*Results of Survey for the Mohave Ground Squirrel* (Spermophilus mohavensis) *on Tentative Parcel No. 19426,* Los Angeles County, California.

Rado, T.October 1991.*Biological Constraints Analysis for Tentative Tract No. 48746, SEA No. 52,* Los Angeles County, California.

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation, Second Edition* Sacramento: California Native Plant Society Press

Stephenson, J.R. and G.M. Calcarone, 1999.*Southern California Mountains and Foothills Assessment: Habitat and Species Conservation Issues*.Gen. Tech. Rep. GTR-PSW-172.Albany, CA.Pacific SW Res. Sta., Forest Serv., U.S. Department Agric., 402 pp.

VTN West, Inc.1988.*Biota Report for Tentative Tract 45238, Parcel Map 19161, SEA No. 49, Case*

No. 87-511, Los Angeles County, California.

Yorke, Callyn D.1991.*Biological Resources Report, SEA No. 55, Parcel Map No. 13584-80 Ac.,* Los Angeles County, California.

Yorke, Callyn D., Ph.D.1990.*Biological Resources Report on APN 3064-16-10, 22, Double G Ranch, SEA No. 55,* Los Angeles County, California.

Cruzan Mesa Vernal Pools SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti(editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded*. Second Edition. Jepson Herbarium, Berkeley, CA. 1600 pp., illus.

Boyd, S.1999.*Vascular Flora of the Liebre Mountains, Western Transverse Ranges, California*.Aliso 18(2): 93-139

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals (898 taxa).* 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants, Bryophytes, and Lichens List.*Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

County of Los Angeles, Department of Regional Planning.2006.*The Cruzan Mesa Vernal Pools SEA Update Study,* Los Angeles County, California.

Fish and Wildlife Services.2000.*Federal Register*."Endangered and Threatened Wildlife and Plants; Proposed Determination of Critical Habitat for the Coastal California Gnatcatcher; Proposed Rule".Fish and Wildlife Services; 32 pp.

Frank Hovore & Associates.*Golden Valley Ranch Biological Resources Report*.1999.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

PCR Services Corporation.2000.Biological Resources Assessment of the Proposed Cruzan Mesa Vernal Pools Significant Ecological Area.19 pp.

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation, Second Edition* Sacramento: California Native Plant Society Press.

Stephenson, J.R. and G.M. Calcarone.1999.*Southern California Mountains and Foothills Assessment: Habitat and Species Conservation Issues.*General Technical Report GTR-PSW-172.Albany, CA:Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 402 pp.

U.S. Fish and Wildlife Service.1997.*Vernal Pools of Southern California Draft Recovery Plan*. U.S.

Fish and Wildlife Service, Portland, Oregon.113+pp.

Zedler, P.H.1987.*The Ecology of Southern California Vernal Pools:A Community Profile*.U.S. Fish and Wildlife Service Biological. Report 85(7.11).136 pp.

East San Gabriel Valley SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012) *The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.* Second Edition. Jepson Herbarium, Berkeley, CA. 1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals* (*898 taxa*). 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants*, *Bryophytes*, *and Lichens List.* Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

County of Los Angeles, Department of Regional Planning. 2006. *The East San Gabriel Valley SEA Description*, Los Angeles County, California.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Los Angeles County, Department of Parks and Recreation. Date unknown. *Bonelli Regional Park Bird List*, San Dimas, California.

Michael Brandman Associates. 1995. *Draft Environmental Impact Report*, *Frank G. Bonelli Regional County Park Master Plan*, *State Clearinghouse No. 94061006*, Los Angeles, California.

Quinn, R.P. Date unknown. *The Status of Walnut Forests and Woodlands* (*Juglans californica*) *in Southern California*, Department of Biological Sciences, California State Polytechnic University, Pomona, California.

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation*, *Second Edition* Sacramento: California Native Plant Society Press.

Griffith Park SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*Special Animals* (898 taxa).60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

County of Los Angeles, Department of Regional Planning.2006.*The Griffith Park SEA Description*,Los Angeles County, California.

City of Los Angeles, Department of Recreation and Parks.2005.*Griffith Park Master Plan Draft/ Redraft of Chapter Four*, *The Plant and Animal World.*

Cooper, Daniel S. and Paul Mathewson.2008.Griffith Park Wildlife Management Plan – Draft.88 pp.

http://www.laparks.org/dos/parks/griffithpk/wildlife/GP_WMP_Draft4.pdf.

Dale, N.1986.Flowering Plants:The Griffith Park, Coastal & Chaparral Regions of Southern California.

Griffith Park Master Plan Working Group.December 2005.*Griffith Park Master Plan*, *Draft* [*Redraft of Chapter Four*],City of Los Angeles, California.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

U.S. Department of the Interior, Fish and Wildlife Service.1998.*Draft Recovery Plan for Six Plants from the Mountains Surrounding the Los Angeles Basin*,Region One, Portland, Oregon.

Harbor Lake Regional Park SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

Boyd, S.1999.*Vascular Flora of the Liebre Mountains*, *Western Transverse Ranges*, *California*.Aliso 18(2):93-139

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*Special Animals* (*898 taxa*).60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

CDM Environmental.December 2006.*Proposition O*, *Final Project Concept Report*, *Machado Lake Ecosystem Rehabilitation Project*, *Section 2.2.3.*City of Los Angeles, California.

County of Los Angeles, Department of Regional Planning.2006.*The Harbor Regional Park SEA Description*, Los Angeles County, California.

Fish and Wildlife Services.2000.*Federal Register*.“Endangered and Threatened Wildlife and Plants;

Proposed Determination of Critical Habitat for the Coastal California Gnatcatcher; Proposed Rule".Fish and Wildlife Services; 32 pp.

Frank Hovore & Associates.*Golden Valley Ranch Biological Resources Report*.1999.

Holland RF.*Preliminary descriptions of the terrestrial natural communities of California*.1986 and 1992 Update.California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

Stephenson, J.R.and G.M.Calcarone.1999.*Southern California Mountains and Foothills Assessment:Habitat and Species Conservation Issues.*General Technical Report GTR-PSW-172.Albany, CA:Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 402 pp.

U.S. Fish and Wildlife Service.1997.*Vernal Pools of Southern California Draft Recovery Plan*.U.S. Fish and Wildlife Service, Portland, Oregon.113+pp.

UtopianNature.com.2005.Heindel, Mitch.http://www.utopianature.com/kmhrp/home.html

Last Accessed August 16, 2011.

Zedler, P.H.1987.*The Ecology of Southern California Vernal Pools:A Community Profile*.U.S. Fish and Wildlife Service Biological.Report 85(7.11).136 pp.

Joshua Tree Woodlands SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*Special Animals* (*898 taxa*).60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

County of Los Angeles, Department of Regional Planning.2006.*The Joshua Tree Woodlands SEA Description*,Los Angeles County, California.

EIP Associates.1990.*Biota Report*, *SEATAC Project 88537*, *the Hughes Ranch*, *Quartz Hill*,Los Angeles County, California.

England & Nelson Environmental Consultants.1976.*Land Capability/Suitability Study*, *Los Angeles County General Plan Revision Program*, *Significant Ecological Areas Report*,Riverside, California.

ESA (Environmental Science Associates).1999.*Biological Constraints of Los Angeles Prayer Mountain*, *SEATAC Analysis Report*,Los Angeles County, California.

Goode, S.1989.*SEATAC Biota Report on #88502*, *47811 Three Points Road*,Los Angeles County, California.

Goode, S.1989.*Revised SEATAC Biota Report on #88502*, *47811 Three Points Road*,Los Angeles County, California.

Goode, S.1989.*Revised Impacts and Mitigations*, *SEATAC Biota Report on #88502*, *47811 Three Points Road*,Los Angeles County, California.

Holland RF.*Preliminary descriptions of the terrestrial natural communities of California*.1986 and 1992 Update.California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Independent Environmental Consultants.1994.*Biological Constraints Analysis*, *the Amargosa Creek Improvement Project*, *Identification and Analysis of Impacts to SEA No.56*,Los Angeles County, California.

Sierra Delta Corporation.1988.*Biota Report for Zond Systems*, *Inc.*, *Los Angeles Wind Electric Generating Station*, *Gorman*, *California*, *Conditional Use Permit 86453*,Las Vegas, Nevada.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

Madrona Marsh Preserve SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*Special Animals* (898 taxa).60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

City of Torrance, 2010, *General Plan Update Draft EIR*, *5.3.1 Environmental Setting.*

County of Los Angeles, Department of Regional Planning.2006.*The Madrona Marsh SEA Description*,Los Angeles County, California.

Fish and Wildlife Services.2000.*Federal Register*."Endangered and Threatened Wildlife and Plants; Proposed Determination of Critical Habitat for the Coastal California Gnatcatcher; Proposed Rule".Fish and Wildlife Services; 32 pp.

Holland RF.*Preliminary descriptions of the terrestrial natural communities of California*.1986 and

1992 Update.California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

U.S. Fish and Wildlife Service.1997.*Vernal Pools of Southern California Draft Recovery Plan*.U.S. Fish and Wildlife Service, Portland, Oregon.113+pp.

Zedler, P.H.1987.*The Ecology of Southern California Vernal Pools:A Community Profile*.U.S. Fish and Wildlife Service Biological.Report 85(7.11).136 pp.

Palos Verdes Peninsula and Coastline SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

County of Los Angeles, Department of Regional Planning.2006.*The Palos Verdes SEA Description*, Los Angeles County, California.

Holland RF.*Preliminary descriptions of the terrestrial natural communities of California*.1986 and 1992 Update.California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

U.S. Department of Commerce.National Oceanic and Atmospheric Administration.National Marine Sanctuary Program.2008.*Channel Islands National Marine Sanctuary Management Plan/Final Environmental Impact Statemant.*Silver Spring, MD

URS.2004.*Environmental Impact Report Draft*, *Rancho Palos Verdes Natural Communities Conservation Planning Subarea Plan* (SCH# 2003071008).Prepared for the City of Rancho Palos Verdes

Puente Hills SEA Sources

Bahrami, M.M., A.M.Dove, E.M.Neaves and B.A.Roberts.1997.*Puente Hills Corridor:Greenspace Connectivity for Wildlife and People*, Department of Landscape Architecture, California State Polytechnic University, Pomona, California.

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*Special Animals* (*898 taxa*).60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

County of Los Angeles, Department of Regional Planning.2006.*The Puente Hills SEA Description*,Los Angeles County, California.

Haas, C.and K.Crooks.1999.*Carnivore Abundance and Distribution Throughout the Puente/ Chino Hills*, The Mountains and Recreation Conservation Authority, Malibu, California

Holland RF.*Preliminary descriptions of the terrestrial natural communities of California*.1986 and 1992 Update.California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Michael Brandman Associates.1993.*Responses to SEATAC Comments and Recommendations on Vista de Lomas Project*, *Powder Canyon SEA No.17*,Los Angeles, California.

Michael Brandman Associates.1992.*Supplemental Biota Report for the Vista de Lomas Hacienda Heights Project Powder Canyon SEA No.17*, *Tentative Tract 51153*,Los Angeles County, California.

Michael Brandman Associates.1992.*Biota Report for the Vista de Lomas Hacienda Heights Projects*, *Tentative Tract 51153*,Los Angeles County, California.

Michael Brandman Associates.1991.*Phase I Study for the Tonner Canyon/Chino Hills SEA No.15.Los Angeles County*, *California.*

Michael Brandman Associates.1991.*Biological Constraints Analysis for the Apple Creek Estates Project*,Los Angeles County, California.

Michael Brandman Associates.1989.*Supplement to Biological Resources Assessment*, *Brea Canyon Tentative Tract No.44478*,Los Angeles County, California.

Michael Brandman Associates.1989.*Supplement to Biological Resources Assessment*, *Brea Canyon Tentative Tract No.44478*,Los Angeles County, California.

Michael Brandman Associates.1989.*Biological Resources Assessment*, *Brea Canyon Tentative Tract No.44478*,Los Angeles County, California.

Michael Brandman Associates.1989.*Biological Resources Assessment*, *A and S Development Site*,Los Angeles, California.

Michael L.Ahlering & Associates, Inc.1988.*Biota Supplement*, *Tentative Tract 46485*,Diamond Bar, California.

Planning Center, The.1990.*Biological Resources Assessment*,*Southern California Golf Association Member's Club at Firestone*, *Tentative Tract No.48380*, *SEA No.15 Tonner Canyon*,Los Angeles,

California.

Planning Center, The.1989.*Biological Resources Assessment*,*Southern California Golf Association Member's Club at Firestone*, *Tentative Tract No.48380*, *SEA No.15 Tonner Canyon*,Los Angeles, California.

Puente Hills ~~Landfill Natural~~ Habitat Preservation Authority.

http://www.habitatauthority.org/publications.shtml

Quinn, Ronald.D.1998.*Status of Black Walnuts* (*Juglans californica*) *in Southern Puente Hills Site*, Department of Biological Sciences, California State Polytechnic University, Pomona, California.

Quinn, Ronald D.1990.*Addendum to Supplement Biota Report*, *Tract No.48632*, *SEA 44*,Hacienda Heights, CA.Los Angeles, California.Department of Biological Sciences, Cal State Polytechnic University, Pomona.

Quinn, Ronald D.1990.*Biota Report*, *Tract No.48632*, *SEA 44*,Hacienda Heights, CA.Los Angeles County, California.Department of Biological Sciences, Cal State Polytechnic University, Pomona

Quinn, Ronald D.1990.*Supplement to Biota Report*, *Tract No.48632*, *SEA 44*,Hacienda Heights, CA.Los Angeles County, California.Department of Biological Sciences, Cal State Polytechnic University, Pomona.

Quinn, Ronald.D.Date unknown.*The Status of Walnut Forests and Woodlands* (*Juglans californica*) *in Southern California*, Department of Biological Sciences, California State Polytechnic University, Pomona, California.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

SWCA Environmental Consultants.2012.Evaluation of functional connectivity for medium- to large-bodied carnivores and mule deer across Colima Road in the Puente Hills Preserve, City of Whittier, California. Prepared for City of Whittier & Puente Hills Habitat Preservation Authority, Whittier, CA.31 pp.

http://www.habitatauthority.org/pdf/Colima%20Road%20Wildlife%20Connectivity%20Assessment%201-5-12.pdf

Rio Hondo College Wildlife Sanctuary SEA Sources

Bahrami, M.M., A.M.Dove, E.M.Neaves and B.A.Roberts.1997.*Rio Hondo Wildlife Sanctuary Corridor:Greenspace Connectivity for Wildlife and People*, Department of Landscape Architecture, California State Polytechnic University, Pomona, California.

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*Special Animals* (*898 taxa*).60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

County of Los Angeles, Department of Regional Planning.2006.*The Rio Hondo Wildlife Sanctuary SEA Update Study*,Los Angeles County, California.

Haas, C.and K.Crooks.1999.*Carnivore Abundance and Distribution Throughout the Puente/ Chino Hills*, The Mountains and Recreation Conservation Authority, Malibu, California

Holland RF.*Preliminary descriptions of the terrestrial natural communities of California*.1986 and 1992 Update.California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Michael Brandman Associates.1993.*Responses to SEATAC Comments and Recommendations on Vista de Lomas Project*, *Powder Canyon SEA No.17*,Los Angeles, California.

Michael Brandman Associates.1992.*Supplemental Biota Report for the Vista de Lomas Hacienda Heights Project Powder Canyon SEA No.17*, *Tentative Tract 51153*,Los Angeles County, California.

Michael Brandman Associates.1992.*Biota Report for the Vista de Lomas Hacienda Heights Projects*, *Tentative Tract 51153*,Los Angeles County, California.

Michael Brandman Associates.1991.*Phase I Study for the Tonner Canyon/Chino Hills SEA No.15.Los Angeles County*, *California.*

Michael Brandman Associates.1991.*Biological Constraints Analysis for the Apple Creek Estates Project*,Los Angeles County, California.

Michael Brandman Associates.1989.*Supplement to Biological Resources Assessment*, *Brea Canyon Tentative Tract No.44478*,Los Angeles County, California.

Michael Brandman Associates.1989.*Supplement to Biological Resources Assessment*, *Brea Canyon Tentative Tract No.44478*,Los Angeles County, California.

Michael Brandman Associates.1989.*Biological Resources Assessment*, *Brea Canyon Tentative Tract No.44478*,Los Angeles County, California.

Michael Brandman Associates.1989.*Biological Resources Assessment*, *A and S Development Site*,Los Angeles, California.

Michael L.Ahlering & Associates, Inc.1988.*Biota Supplement*, *Tentative Tract 46485*,Diamond Bar, California.

Planning Center, The.1990.*Biological Resources Assessment*,*Southern California Golf Association Member's Club at Firestone*, *Tentative Tract No.48380*, *SEA No.15 Tonner Canyon*,Los Angeles, California.

Planning Center, The.1989.*Biological Resources Assessment*,*Southern California Golf Association*

Member's Club at Firestone, *Tentative Tract No.48380*, *SEA No.15 Tonner Canyon*,Los Angeles, California.

Quinn, Ronald.D.1998.*Status of Black Walnuts* (*Juglans californica*) *in Southern Rio Hondo Wildlife Sanctuary Site*, Department of Biological Sciences, California State Polytechnic University, Pomona, California.

Quinn, Ronald D.1990.*Addendum to Supplement Biota Report*, *Tract No.48632*, *SEA 44*,Hacienda Heights, CA.Los Angeles, California.Department of Biological Sciences, Cal State Polytechnic University, Pomona.

Quinn, Ronald D.1990.*Biota Report*, *Tract No.48632*, *SEA 44*,Hacienda Heights, CA.Los Angeles County, California.Department of Biological Sciences, Cal State Polytechnic University, Pomona

Quinn, Ronald D.1990.*Supplement to Biota Report*, *Tract No.48632*, *SEA 44*,Hacienda Heights, CA.Los Angeles County, California.Department of Biological Sciences, Cal State Polytechnic University, Pomona.

Quinn, Ronald.D.Date unknown.*The Status of Walnut Forests and Woodlands* (*Juglans californica*) *in Southern California*, Department of Biological Sciences, California State Polytechnic University, Pomona, California.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

URS.2006.*Draft Master Environmental Impact Report*, *Rio Hondo College Master Plan*, *Section 3.3.Biological Resources*, Los Angeles, CA.

San Andreas SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti(editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded*.Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

Boyd, S.1999.*Vascular Flora of the Liebre Mountains, Wester Transverse Ranges, California.*

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants, Bryophytes, and Lichens List.*Quarterly publication. 71 pp.

County of Los Angeles, Department of Regional Planning.2006.*The San Andreas SEA Description,* Los Angeles County, California.

EIP Associates.1990.*Biota Report, SEATAC Project 88537, the Hughes Ranch, Quartz Hill,* Los Angeles County, California.

England & Nelson Environmental Consultants.1976.*Land Capability/Suitability Study, Los Angeles County General Plan Revision Program, Significant Ecological Areas Report,* Riverside, California.

Environmental Audit, Inc.November 1989.*Biota Report for Barrel Springs Ranch 63 Acre Tract,*

Palmdale, California.

ESA (Environmental Science Associates).1999.*Biological Constraints of Los Angeles Prayer Mountain, SEATAC Analysis Report,* Los Angeles County, California.

Goode, S.1989.*SEATAC Biota Report on #88502, 47811 Three Points Road,* Los Angeles County, California.

Goode, S.1989.*Revised SEATAC Biota Report on #88502, 47811 Three Points Road,* Los Angeles County, California.

Goode, S.1989.*Revised Impacts and Mitigations, SEATAC Biota Report on #88502, 47811 Three Points Road,* Los Angeles County, California.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Independent Environmental Consultants.1994.*Biological Constraints Analysis, the Amargosa Creek Improvement Project, Identification and Analysis of Impacts to SEA No. 56,* Los Angeles County, California.

Sierra Delta Corporation.1988.*Biota Report for Zond Systems, Inc., Los Angeles Wind Electric Generating Station, Gorman, California, Conditional Use Permit 86453,* Las Vegas, Nevada.

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation, Second Edition* Sacramento: California Native Plant Society Press.

Vollmar Consulting, Berkeley, CA. 2004. *Centennial Specific Plan Project Site 2003/2004 Botanical Survey Report. Landscape Setting; Special-Status Plant Surveys; Perennial Bunchgrass Community Study. 108 pp. 13 fig, 11 tables, 2 graphs, 3 appendices.*

San Dimas Canyon and San Antonio Wash SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

Baskin, J.N.and T.R.Haglund, T.R.1995.*Distribution and Abundance of Native Fishes*, *Southwestern Pond Turtles and Two-Striped Garter Snakes Below Morris Dam and in Brown's Gulch*, *San Gabriel River Canyon.*San Marino Environmental Associates, San Marino, California.45 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*Special Animals* (898 taxa).60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

County of Los Angeles, Department of Regional Planning.2006.*The San Dimas-San Antonio Wash SEA Description*,Los Angeles County, California.

Holland RF.*Preliminary descriptions of the terrestrial natural communities of California*.1986 and 1992 Update.California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Planning Consultants Research.1995.*Biological Assessment for the Big Dalton Dam Modification Project*,Santa Monica, California.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

Stephenson, J.R.and G.M.Calcarone.1999.*Southern California Mountains and Foothills Assessment:Habitat and Species Conservation Issues.*General Technical Report GTR-PSW-172.Albany, CA:Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 402 pp.

San Gabriel Canyon SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

Baskin, J.N.and T.R.Haglund.1995.*Distribution and Abundance of Native Fishes*, *Southwestern Pond Turtles and Two-Striped Garter Snakes Below Morris Dam and in Brown's Gulch*, *San Gabriel River Canyon.*San Marino Environmental Associates, San Marino, California.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*Special Animals* (*898 taxa*).60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

County of Los Angeles, Department of Regional Planning.2006.*San Gabriel Canyon SEA Description*,Los Angeles County, California.

Holland RF.*Preliminary descriptions of the terrestrial natural communities of California*.1986 and 1992 Update.California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Planning Consultants Research.1995.*Biological Assessment for the Big Dalton Dam Modification Project*,Santa Monica, California.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

Stephenson, J.R.and G.M.Calcarone.1999.*Southern California Mountains and Foothills Assessment:Habitat and Species Conservation Issues.*General Technical Report GTR-PSW-172.Albany, CA:Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture.

Santa Clara River SEA Sources

Aspen Environmental Group.1995.*Draft EIS Pacific Pipeline Project:Biological Assessment*, *Vol. II.*Prepared for the California Public Utilities Commission.

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual:Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

Bowland, J.L.1989.*Biota Report*, *PM 20108; PM 20148*, *Project Numbers 88371 and 88416*, *SEA No. 23*, Acton, California.

Boyd, S.1999.*Vascular flora of the Liebre Mountains*, *western transverse ranges*, *California*. Publ. #5, Rancho Santa Ana Botanic Garden, Claremont, CA, in Aliso, 18(2):93-139

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals* (*898 taxa*). 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

California Native Plant Society.1994.*Inventory of Rare and Endangered Vascular Plants of California.*

Chambers Group.1994.*EIR:Soledad Canyon Sand and Gravel Mining.*

CNDDB (California Natural Diversity Database).2000.*Multiple Records Search for the Val Verde*, *Newhall*, *Mint Canyon*, *Acton*, *and Aqua Dulce Quadrangles.*

Coatsworth, S.1990.*Biota Report for Tentative Parcel Map 21462*, *SEA No. 61*, Los Angeles County, California.

Coatsworth, S.1989, resubmitted 1990.*Biota Report for Tentative Parcel Map 20461*, *SEA No. 61*, Los Angeles County, California.

Coatsworth, S.1989, resubmitted 1990.*Biota Report for Tentative Parcel Map 20726*, *SEA No. 61*, Los Angeles County, California.

County of Los Angeles, Department of Regional Planning.2006.*The Santa Clara River SEA Update Study*, Los Angeles County, California.

Dames and Moore & Sikand Engineering Associates.1991.*Addendum to the SEATAC Report for a Portion of SEA No. 19*, *Tentative Map 44831*, *C.U.P. 86-491*, Los Angeles County, California.

EAI (Environmental Audit Inc.).1990.*Biota Report for Raphael 9.3 Acre Parcel*, Los Angeles County, California.

England & Nelson Environmental Consultants.1976.*Land Capability/Suitability Study*, *Los Angeles County General Plan Revision Program*, *Significant Ecological Areas Report*, Riverside, California.

Fishman, R.H., Charlton, D. and R. Stafford.1990, revised August 1990.*Biota Survey and Impact Assessment for Parcel Map #20348*, *Angeles Forest Highway*, Los Angeles County, California.

Fishman, R.H., Charlton, D. and M. Hagan.1989, revised July 1989.*Biota Survey and Impact Assessment for Parcel Map #19258*, *Angeles Forest Highway*, Los Angeles County, California.

Frank Hovore & Associates.1999.*Biological Resources Report*, *Placerita Chaparral / Mitchell Development*.

Frank Hovore & Associates.1998.*Biological Resources Report*, *Golden Valley Ranch*.

Frank Hovore & Associates.1997.*Biological Constraints Assessment*, *Oak Springs Golf Course*, TT 52004.

Frank Hovore & Associates.1996.*Biotic Assessment and Report of Sensitive Resource Surveys*, *L.A. Department of Water and Power*, *Castaic Power Plant and Vicinity*, *L. A. County*, *California*.

Frank Hovore and Associates.1990.*SEATAC Biota Report*, *SEA No. 61*, *Kentucky Springs*, *Tentative Parcel Map No. 22107*, Acton, California.

Frank Hovore and Associates.1990.*SEATAC Biota Report*, *Supplemental Materials to Tierra Madre Consultants* (*TMC*) *Report on Tentative Parcel Maps 19628*, *19899*, *20056*, *20057*, *San Francisquito Canyon*, *SEA No. 19.*

Frank Hovore and Associates.1989.*SEATAC Biotic Report*, *SEA No. 23 the Santa Clara River Buffer Zone*, *Tentative Tract 21273*, *Project No. 89315*, Santa Clarita, California.

Furgo-McClelland (West), Inc.1992.*Biota Report for theAgua Dulce Quarry* (*Project No. 91307*).

Guthrie, D.1995.*Bird Surveys Along the Santa Clara River and its Tributaries Near Valencia*, *California*.

Guthrie, D.1993.*Bird Surveys Along the Santa Clara River and its Tributaries Near Valencia*, *California*.

Guthrie, D.1990.*Bird Surveys Along the Santa Clara River and its Tributaries Near Valencia*, *California*.

Guthrie, D.1988.*Bird Surveys Along the Santa Clara River and its Tributaries Near Valencia*, *California*.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Hovore, Frank T.*Checklist of the birds of Robinson Ranch golf course development*.2000.2 page leaflet.

ISI (Impact Sciences, Inc.).1995.*Biological Constraints Analysis*, *Tentative Parcel Map 19091* (*West San Francisquito Creek*), Los Angeles County, California.

ISI (Impact Sciences, Inc.).1995.*Biota Report for Creekside Village Project*, *Tentative Tract Map 44831*, Los Angeles County, California.

ISI (Impact Sciences, Inc.).1995a.*Biological Constraints Analysis:Ranch Road South Project*, *Valencia*, *California*, *Tentative Tract Map 51931.*

ISI (Impact Sciences, Inc.).1995b.*Biota Report:West Creek Project.*

ISI (Impact Sciences, Inc.).1995c.*Biota Report:West Creek Project. Supplemental Information Submitted to SEATAC at Their Request on December 16*, *1995.*Prepared for Los Angeles County Department of Regional Planning, Los Angeles, California.

ISI (Impact Sciences, Inc.) and RECON.1995.*Biota Report*, *Newhall Ranch Specific Plan*, *Temtative Tract Map 44831*, Santa Clara River Valley, California.

ISI (Impact Sciences, Inc.) and RECON.1994.*Biological Constraints Analysis:Newhall Ranch*, *California*, *Case No. 94087*.

Independent Environmental Consultants.1992.*Biological Constraints Analysis of Tentative Minor Land Division Map No. 23217*, *in Buffer Zone of SEA No. 23 Soledad Canyon*, *Santa Clara River*, *Los Angeles County*, *CA*.

Independent Environmental Consultants.1992.*SEATAC Report for Tentative Minor Land Division Map. No. 91253*, Los Angeles, California.

Independent Environmental Consultants.1992.*SEATAC Report for Tentative Minor Land Division Map. No. 91253* [Response to comments], Los Angeles, California.

Independent Environmental Consultants.1990.*SEATAC Report for a Portion of SEA No. 19. Tentative Tract Map 44831.August 21.*Prepared for Valencia Company.

Independent Environmental Consultants and Sikand Engineering Associates.1988, revised 1989.*SEATAC Report for a Portion of SEA No. 23*, Arbor Park, California.

John M. Tettemer & Associates, Ltd.1994.*Response to U.S. Army Corps of Engineers Scoping Notice Comments for the U.S. Army Corps of Engineers*, *General Section 404 Permit*, *Santa Clara River from Castaic Creek to One-Half Mile Above the Los Angeles Aqueduct and Portions of San Francisquito Creek and the Santa Clara River*, *South Fork*, Los Angeles County, California.

John M. Tettemer & Associates, Ltd.1993.*Biological Assessment:General Permit for the Santa Clara River from Castaic Creek to One-Half Mile Above the Los Angeles Aqueduct*, *Portions of San Francisquito Creek*, *and the Santa Clara River*, *South Fork*, Los Angeles County, California.

John M. Tettemer & Associates, Ltd.1993, addendum submitted October 1993.*U.S. Army Corps*

ofEngineers, *General Section 404 Permit*, *Santa Clara River from Castaic Creek to One-Half Mile Above the Los Angeles Aqueduct and Portions of San Francisquito Creek and the Santa Clara River*, *South Fork*, Los Angeles County, California.

Los Angeles County Museum of Natural History.1991.*Los Angeles County Breeding Bird Atlas*, *Santa Clarita Valley blocks*.California.

Mane′e Planning, Economic and Environmental Services.1989.*Ecological Impact Evaluation for Surface Mining Permit 86-357*, *Curtis Sand and Gravel* (*revised*), Yucaipa, California.

Marsh, K.G.1990.*Biota Report*, *Los Angeles County Project No. 89189*, *forSurface Mining Within SEA No. 23* (*Santa Clara River*), Los Angeles County, California.

MBA (Michael Brandman & Associates).1991.*Phase I Report:San Francisquito Canyon SEA No. 19*, Los Angeles County, California.

MBA (Michael Brandman & Associates).1991.*Phase I Study for the Kentucky Springs SEA No. 61*, Los Angeles County, California.

MBA (Michael Brandman & Associates).1992.*Biological Constraints forClougherty Ranch Project.*

MBA (Michael Brandman & Associates).1993 (revisions and supplemental info.).*Biota Report for theTesoro del Valle Project.*

Mattoni, R.*Butterflies of greater Los Angeles*.wall poster, 2 sides.Rachel Tierney Consulting.1996.*Supplemental Biota Report. Soledad Rock Quarry.*

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press

Schoenherr, A.1976.*The Herpetofauna of the San Gabriel Mountains*, *Los Angeles County*, *California*, *including distribution and biogeography.*Spec. Publ. Southwestern Herpetologists Society.

SEATAC Biota Report, *West Creek* (*VTTM 52455*) *and East Creek* (*VTTMs 44831*, *52667*) *San Francisquito Canyon*, *Santa Clarita*, *Los Angeles County*, *CA*.1998

SEATAC Biota Report, *North Valencia Annexation 2 Project* (*VTTM's 44831*, *52667*) *San Francisquito Canyon*, *Santa Clarita*, *Los Angeles County*, *CA*.1998

Stephenson, J.R. and G.M. Calcarone, 1999.*Southern California mountains and Foothills Assessment:Habitat and Species Conservation Issues*.Gen. Tech. Rep. GTR-PSW-172.Albany, CA.Pacific SW Res. Sta., Forest Serv., U.S. Department Agric., 402 pp.

Taylor & Company.1995.*Biota Report:Los Angeles County Project No. 94-129*, *Soledad Rock Quarry*, *Surface Mining Permit*, *Conditional Use Permit*, Los Angeles County, California.

Tierra Madre Consultants.1990.*Biota Report on Tentative Parcel Maps 19628*, *19899*, *20056*, *and 20057.*

Warren B. Houghton.1986.*Biota Report on Parcel Map 17684*, *SEA No. 19*, Los Angeles County,

California

Yorke, C.1990.*Addendum to Biological Resources Report*, *Project No. 90113 / PM 21856*, *Kentucky Springs*, Los Angeles County, California.

Yorke, C.1990.*SEATAC Biota Report*, *APN 3056-12-31*, *Kentucky Springs*, *SEA No. 61*, *Project No. 90113*, Los Angeles County, California.

Yorke, C.1989.*SEATAC Biota Report*, *APN 3209-14-21*, *Santa Clara River Buffer Zone SEA 23.*

Yorke, C.1989.*Biota Report for Frank Collins*, *C/O Archer Real Estate*, *SEA No. 23*, Canyon Country, California.

Santa Felicia SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals (898 taxa).* 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants, Bryophytes, and Lichens List.*Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

County of Los Angeles, Department of Regional Planning.1993.*Additional Information and Analysis Regarding the Environmental Impact Report for the Sunshine Canyon Landfill Extension*, Los Angeles County, California.

County of Los Angeles, Department of Regional Planning.2006.*The Santa Felicia SEA Description,* Los Angeles County, California.

Guthrie, Daniel A. and B. A. Prigge.1989 (Jan. 31, 1990).*Emendations I & II of Biological Survey of Case 88551,Housing Development for Tract No. 47329, Unincorporated Area of Chatsworth*, Los Angeles County, California.

Guthrie, Daniel A. and B. A. Prigge.1989 (revised Dec. 26, 1991).*Biological Survey of Case 88551,Housing Development for Tract No. 47329, Unincorporated Area of Chatsworth,* Los Angeles County, California.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Los Angeles Department of Regional Planning, 2010 Revised Draft Santa Clarita Valley Area Plan.

Michael Brandman Associates.1995.*Biological Constraints Analysis for Tentative Parcel Map No. 23793*, Los Angeles County, California.

Michael Brandman Associates.1989.*Supplemental to Biological Resources Assessment of Indian Wells Estates, Tentative Tract 44327*, Los Angeles County, California.

Michael Brandman Associates.1988.*Biological Resources Assessment, Woolsey Canyon Project Site, Tentative Tract 45756*, Los Angeles County, California.

Penrod, Kristeen, Clint R. Cabañero, Paul Beier, Wayne Spencer, Claudia Luke, and Esther Rubin. 2005.A linkage design for the Sierra Madre-Castaic Connection.South Coast Missing Linkages Project.www.scwildlands.org.x, 98 pp., Appendices A,B.

Regional Environmental Consultants (RECON) and Impact Sciences.1995.*Biota Report, Newhall Ranch Specific Plan, Volume I of II, Santa Clara River Valley*, California, Tentative Tract Map 44831.

Regional Environmental Consultants (RECON) and Impact Sciences.1995.*Biota Report, Newhall Ranch Specific Plan, Volume II of II, Santa Clara River Valley*, California, Tentative Tract Map 44831.

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation, Second Edition* Sacramento: California Native Plant Society Press

Ultrasystems Engineers & Constructors, Inc.Environmental Services.1991.*Seatac Report.Tentative Tract No. 43896*, Los Angeles County, California.Dale Poe Development Corporation.

Ultrasystems Engineers & Constructors, Inc.Environmental Services.1991.*Seatac Report. Supplemental Information.Tentative Tract No. 43896*.Los Angeles County, California.Dale Poe Development Corporation.

Ultrasystems Engineers & Constructors, Inc.Environmental Services.1991.*Seatac Report. Supplemental Report No. 2.Tentative Tract No. 43896*.Los Angeles County, California.Dale Poe Development Corporation.

Ultrasystems Engineers & Constructors, Inc.Environmental Services.1990.*Biotic Report for Sunshine Mountain Park, Travel Trailer Park, Santa Clarita Valley*, California.

Santa Monica Mountains SEA Sources

Atlantis Scientific.1990.*Biological Impact Report, Project No. 90088/PM - 21998/CUP,* Beverly Hills, California.

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

Biological Assessment Services.1992.*Biological Resources Assessment Vesting Tentative Tract No. 47927, SEA No. 12, Palo Comado Canyon,* Los Angeles County, California.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals* (*898 taxa*)*.* 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011.

*Special Vascular Plants, Bryophytes, and Lichens List.*Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

C.W. Cook Co.Inc.1990.*SEATAC Information Packet for SEA No. 4, Project No. 86089* (*Biology Reports*), Los Angeles, California.

Coatsworth, S. and T. Laughlin.1989.*Biota Report fo Tentative Tract No. 48238, SEA No. 5,* Los Angeles County, California.

County of Los Angeles, Department of Regional Planning.2006.*The Santa Monica Mountains SEA Description,* Los Angeles County, California.

County of Los Angeles, Department of Regional Planning.1999.*The Santa Monica Mountains North Area Plan* (*Draft*)*,* Los Angeles County, California.

Countyof Los Angeles, Department of Regional Planning.1996.*Environmental Impact Report Vol. 1* (*Screencheck Draft*)*, Project No. 89-251, SEA No. 12,* Los Angeles County, California.

Dale, N.1986.Flowering Plants:The Santa Monica Mountains, Coastal & Chaparral Regions of Southern California.

David Carroll & Associates.1992.*Biological Constraints Analysis Report, Project No. 91-359, SEA No. 3 Buffer, Latigo Canyon Road,* Los Angeles County, California.

David Carroll & Associates.1991.*Biota Report for Subdivision Parcel Map No. 89494 Latigo Canyon,* Los Angeles County, California.

David J. Tanner & Associates.1988.*Biological Resources Assessment and Tree Inventory and Evaluation for Malibu Terrace, Tract No. 45342 and No. 45343, SEA No. 12,* Los Angeles County, California.

Edelman, Paul.1990 (revised 2/91).*Critical Wildlife Corridor/Habitat Linkage Areas Between the Santa Susana Mountains, The Simi Hills and The Santa Monica Mountains,* Los Angeles County, California.

Envicom Corporation.1999.*Biota Report* (*Resubmittal No. 2*)*, Beautiful Homes Site,* Los Angeles County, California.

Envicom Corporation.1992.*Biological Constraints Analysis, Tentative Parcel Map 22352, SEA No. 3,* Los Angeles County, California.

Envicom Corporation.1992.*Soka UniversityExpansion Project,* Los Angeles County, California.

Envicom Corporation.1990.*Biota Report for Lots 159 and 160 of Tentative Tract No. 32268,* Calabasas, California.

Envicom Corporation.1990.*Biota Report for Old West Valley Driving Range* (*2nd Submittal*)*,* Calabasas, California.

Envicom Corporation.1990.*Biota Report for Old West Valley Driving Range*, Calabasas, California.

Envicom Corporation.1990.*Supplemental Oak Tree Report for Old West Valley Driving Range, SEA No. 12,* Calabasas, California.

Envicom Corporation.1989.*Oak Tree Report for Lots 159 and 160 of Tentative Tract No. 32268 for Bulk Grading Disposal for Adjacent Tract No. 37824,* Calabasas, California.

Envicom Corporation.1989.*Biota Report, SEA No. 3 Buffer, Mulholland Highway Residential Development* (*4th Submittal*)*,* Los Angeles County, California.

Envicom Corporation.1989.*Biota Report* (*resubmittal*) *for Conditional Use Permit Case No. 87361, SEA No. 5,* Los Angeles County, California.

Envicom Corporation.1989.*Biota Report for Conditional Use Permit Case No. 87361, SEA No. 5,* Los Angeles County, California.

Environmental Audit, Inc.1990.*Biota Report for Pepperdine University LRDP Developments, Including CUP Application No. 90-218,* Malibu, California.

Environmental Audit, Inc.1990.*Biota Report for Raphael 9.3 Acre Parcel* (*Tentative Parcel Map No. 20549*) *at 31905 Pacific Coast Highway,* Malibu, California.

Hartzell, A.K. and H. Hewitt.1992.~~Fish and Game~~Fish and Wildlife's Control Over Land Use.*California Planner* 4(8): 1-9.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Impact Sciences, Inc.1988.*Biota Report for Calabasas Park West Project, SEA No. 12,* LosAngelesCounty, California.

Impact Sciences, Inc.1988.*Biota Report for Calabasas Road Expansion, SEA No. 12,* (*Amended June 1988*)*,* Los Angeles County, California.

Independent Environmental Consultants.1993.*SEATAC Report for Tentative Minor Land Division Map No. 22648, Case No. 91253, SEA No. 3 Buffer, 32356 Mulholland Highway, in Unincorporated Territory of the Santa Monica Mountains,* Los Angeles County, California.

L. Newman Design Group, Inc.1995.*Oak Tree Report, Vesting Tentative Tract No. 47927, SEA No. 12,* Los Angeles County, California.

Lee Newman & Associates, Inc.1988.*Tree Report:The Salvation Army Camp* (*Mt. Crags Camp and Camp Gilmore*)*,* Los Angeles County, California.

Lieberstein, T.A.1989.*Reserve Design in the Santa Monica Mountains.*Thesis for M.A. degree, Cal State Univ. Northridge.

Land and Water Company, The.1992.*Biological Constraints Analysis Supplemental Report, Potential Impacts of Development andMitigation, Project No. 91-359,* Los Angeles County, California.

McAuley, M.1996 (2nd ed.).*Wildflowers of the Santa Monica Mountains*.Canyon Publishing:Canoga Park, CA, USA.

McClelland Consultants (West), Inc.1991.*Biota Report for Tentative Tract Map No. 21221* (*3rd submittal*), Los Angeles County California.

Michael Brandman Associates.1991.*Phase I Study for the Cold Creek SEA No. 9,* Los Angeles County, California.

Michael Brandman Associates.1991.*Phase I Study for the Las Virgenes SEA No. 6,* Los Angeles County, California.

Michael Brandman Associates.1991.*Phase I Study for the Tuna Canyon SEA No. 10*, Los Angeles County, California.

Michael Brandman Associates.1991.*Biological Resources Assessment for theLiberty Canyon Project* (*Resubmittal*)*, Project No. 90152, SEA No. 12,* Los Angeles County, California.

Michael Brandman Associates.1991.*Biological Resources Assessment for theLiberty Canyon Project, Project No. 90152, SEA No. 12*, Los Angeles County, California.

Michael Brandman Associates.1990.*Biological Resources Assessment for theCordillera Reclaimed Water Tank and Ancillary Facilities, Las Virgenes Municipal Water District, SEA No. 12,* Los Angeles County, California.

Michael Brandman Associates.1989.*Biological Resources Assessment for the Seminole Water Tank No. 2, Los Virgenes Municipal Water District, SEA No.3 Buffer,* Los Angeles County, California.

Michael Brandman Associates.1989.*Biological Resources Assessment for Malibu Terrace Project Site, Project No. 87527, SEA No. 12,* Los Angeles County, California.

Nelson, Erik.2000.“Cameras Capture Critter Commuters”, *Daily News*, Monday May 22, 2000.

P&D Environmental Services.1995.*Biological Resources Assessment for Tentative Tract No. 47927, SEA No. 12, Palo Comado Canyon,* Los Angeles County, California.

P&D Environmental Services.1995.*Biological Resources Assessment Vesting Tentative Tract No. 47927, SEA No. 12, Palo Comado Canyon,* Los Angeles County, California.

Planning Center, The.1991.*Biological Resources Assessment for Tentative Tract No. 21887, SEA No. 3,* Los Angeles County, California.

Planning Center, The.1990.*Biological Resources Assessment for Tentative Tract No. 47927, SEA No. 12 Palo Comado Canyon,* Los Angeles County, California.

Raven, Peter H., Henry J. Thompson, and Barry A. Prigge.1986.Flora of the Santa Monica Mountains, California, 2nd edition. Southern California Botanists Special Publication No.2.

Rindlaub, K.1989.*Biological Resources Evaluation, Julian Property, Loma Metisse and Rotunde*

Mesa Road, Santa Monica Mountains, SEA No. 5, Los Angeles County, California.

Rindlaub, K.1989.*Biological Resources Evaluation, Julian Property, Loma Metisse and Rotunde Mesa Road, Santa Monica Mountains,* Los Angeles County, California.

Ryan Ecological Consulting. 2010.The Western Snowy Plover in Los Angeles County, California.Report to California Department of ~~Fish and Game~~Fish and Wildlife. 136 pp.

http://losangelesaudubon.org/images/stories/pdf/westernsnowyploverin%20losangelescounty.pdf

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation, Second Edition* Sacramento: California Native Plant Society Press.

U.S. Department of the Interior, Fish and Wildlife Service.1998.*Draft Recovery Plan for Six Plants from the Mountains Surrounding the Los Angeles Basin,* Region One, Portland, Oregon.

U.S. Department of the Interior, National Park Service.1998.*Santa Monica Mountains National Recreation Area Land Protection Plan,* Los Angeles County, California.

USFWS.2000.*Draft Recovery Plan for the red-legged Frog* (*Rana aurora draytonii*).U.S. Fish and Wildlife Service, Portland, Oregon. 258 pp.

Vincent N. Scheidt, M.A., Biological Consultant.1991.*Biota Report for the Vierich Lot-Split Project, Parcel Map No. 21737; File No. 90259,* Los Angeles County, California.

Yorke, Callyn D., Ph.D.1993.*Response to SEATAC Comments of February 1, 1993, 50 Acres, 2700 Corral Canyon Road, Malibu, Project No. 90-504/TR 50290*, Los Angeles County, California.

Yorke, Callyn D., Ph.D.1992.*Biological Resources Report on 50 Acres, 2700 Corral Canyon Road, Malibu, Project No. 90504,* Los Angeles County, California.

Yorke, Callyn D., Ph.D.1992.*Biological Resources Report on 10.8 Acres, SEA No. 5 Buffer, Malibu* (*Project No. 88217*), Los Angeles County, California.

Yorke, Callyn D., Ph.D.1992.*Biological Resources Report on 50 Acres, 2700 Corral Canyon Road, Project No. 90504,* Los Angeles County, California.

Yorke, Callyn D., Ph.D.1991.*Biological Resources Report on 10.8 Acres, SEA No. 5 Buffer, Malibu* (*Project No. 88217*)*,* Los Angeles, California.

Yorke, Callyn D., Ph.D.1991.*Biological Resources Report on 50 Acres, 2700 Corral Canyon Road, Project No. 90504,* Los Angeles County, California.

Santa Susana Mountains and Simi Hills SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January

2011. *Special Animals (898 taxa).* 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants, Bryophytes, and Lichens List.*Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

County of Los Angeles, Department of Regional Planning.1993.*Additional Information and Analysis Regarding the Environmental Impact Report for the Sunshine Canyon Landfill Extension*, Los Angeles County, California.

County of Los Angeles, Department of Regional Planning.2006.*The Santa Susana Mountains- Simi Hills SEA Description,* Los Angeles County, California.

Envicom Corporation.1992 (revised Feb. 4, 1993).*A Consideration of Wildlife Movements in the Santa Susana Mountains*, Los Angeles County, California.

Guthrie, Daniel A. and B. A. Prigge.1989 (Jan. 31, 1990).*Emendations I & II of Biological Survey of Case 88551,Housing Development for Tract No. 47329, Unincorporated Area of Chatsworth*, Los Angeles County, California.

Guthrie, Daniel A. and B. A. Prigge.1989 (revised Dec. 26, 1991).*Biological Survey of Case 88551,Housing Development for Tract No. 47329, Unincorporated Area of Chatsworth,* Los Angeles County, California.

Guthrie, Daniel A. and B. A. Prigge.1988.*Biological Survey of Case 88312,Christara Motion Picture Studio Site, 23747, The Old Road, Unincorporated Area of Newhall*, Los Angeles County, California

Henrickson, James, PhD.1996.*Biological Constraints Analysis Zone Change – Conditional Use Permit 96-113, 22925 Coltrane Avenue, Within SEA No. 20, Santa Susana Mountains*, Los Angeles County, California.

Henrickson, James, PhD., Independent Environmental Consultants.1992.*Biological Constraints Analysis of Tentative Minor Land Division Map No. 23217, in Buffer Zone of SEA No. 23, Soledad Canyon, Santa Clara River*, Los Angeles County, California.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Impact Sciences, Inc.1996 (Supplemental Info. Submitted Nov. 2, 1999).*Biota Report, Dahl Property, SEA No. 21, Tentative Parcel Map 23793*, Chatsworth, California.

Impact Sciences, Inc. and RECON.1994.*Biological Constraints Analysis, Newhall Ranch*, California, Case No. 94087.

Michael Brandman Associates.1995.*Biological Constraints Analysis for Tentative Parcel Map No. 23793*, Los Angeles County, California.

Michael Brandman Associates.1989.*Supplemental to Biological Resources Assessment of Indian*

Wells Estates, Tentative Tract 44327, Los Angeles County, California.

Michael Brandman Associates.1988.*Biological Resources Assessment, Woolsey Canyon Project Site, Tentative Tract 45756*, Los Angeles County, California.

Regional Environmental Consultants (RECON) and Impact Sciences.1995.*Biota Report, Newhall Ranch Specific Plan, Volume I of II, Santa Clara River Valley*, California, Tentative Tract Map 44831.

Regional Environmental Consultants (RECON) and Impact Sciences.1995.*Biota Report, Newhall Ranch Specific Plan, Volume II of II, Santa Clara River Valley*, California, Tentative Tract Map 44831.

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation, Second Edition* Sacramento: California Native Plant Society Press

Ultrasystems Engineers & Constructors, Inc.Environmental Services.1991.*Seatac Report.Tentative Tract No. 43896*, Los Angeles County, California.Dale Poe Development Corporation.

Ultrasystems Engineers & Constructors, Inc.Environmental Services.1991.*Seatac Report. Supplemental Information.Tentative Tract No. 43896*.Los Angeles County, California.Dale Poe Development Corporation.

Ultrasystems Engineers & Constructors, Inc.Environmental Services.1991.*Seatac Report. Supplemental Report No. 2.Tentative Tract No. 43896*.Los Angeles County, California.Dale Poe Development Corporation.

Ultrasystems Engineers & Constructors, Inc.Environmental Services.1990.*Biotic Report for Sunshine Mountain Park, Travel Trailer Park, Santa Clarita Valley*, California.

Tujunga Valley and Hansen Dam SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*Special Animals* (*898 taxa*).60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

County of Los Angeles, Department of Regional Planning.2006.*The Tujunga Valley/ Hansen Dam SEA Description*, Los Angeles County, California.

Hartzell, A.K.and H.Hewitt.1992.~~Fish and Game~~Fish and Wildlife's Control Over Land Use.*California Planner* 4(8):1-9.

Holland RF.*Preliminary descriptions of the terrestrial natural communities of California*.1986 and 1992 Update.California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

URS Environmental Services.2006.*Big Tujunga Dam Seismic Upgrade*, *Initial Study and Mitigated Negative Declaration*, Los Angeles County

U.S. Department of the Interior, Fish and Wildlife Service.1998.*Draft Recovery Plan for Six Plants from the Mountains Surrounding the Los Angeles Basin*, Region One, Portland, Oregon.

U.S. Department of the Interior, National Park Service.1998.*Santa Monica Mountains National Recreation Area Land Protection Plan*, Los Angeles County, California.

Valley Oaks Savannah SEA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*Special Animals* (*898 taxa*).60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

County of Los Angeles, Department of Regional Planning.2006.*The Santa Monica Mountains SEA Update Study*,Los Angeles County, California.

County of Los Angeles, Department of Regional Planning.1996.*Environmental Impact Report Vol.1* (*Screencheck Draft*), *Project No.89-251*, *SEA No.12*,Los Angeles County, California.

Dale, N.1986.Flowering Plants:The Santa Monica Mountains, Coastal & Chaparral Regions of Southern California.

Edelman, Paul.1990 (revised 2/91).*Critical Wildlife Corridor/Habitat Linkage Areas Between the Santa Susana Mountains*, *The Simi Hills and The Santa Monica Mountains*,Los Angeles County, California.

Los Angeles Department of Regional Planning, 2010 Revised Draft Santa Clarita Valley Area Plan.

McAuley, M.1996 (2nd ed.).*Wildflowers of the Santa Monica Mountains*.Canyon Publishing:Canoga Park, CA, USA.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

U.S. Department of the Interior, National Park Service.1998.*Santa Monica Mountains National Recreation Area Land Protection Plan*,Los Angeles County, California.

Verdugo Mountains SEA Sources

Atlantis Scientific.1990.*Biological Impact Report*, *Project No.90088/PM - 21998/CUP*, Beverly Hills, California.

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012)*The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.*Second Edition.Jepson Herbarium, Berkeley, CA.1600 pp., illus.

Biological Assessment Services.1992.*Biological Resources Assessment Vesting Tentative Tract No.47927*, *SEA No.12*, *Palo Comado Canyon*,Los Angeles County, California.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*Special Animals* (898 taxa).60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.April 2011.*Special Vascular Plants*, *Bryophytes*, *and Lichens List.*Quarterly publication.71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database.January 2011.*State and Federally Listed Endangered and Threatened Animals of California.*13 pp.

C.W.Cook Co.Inc.1990.*SEATAC Information Packet for SEA No.4*, *Project No.86089* (Biology Reports), Los Angeles, California.

Christopher A.Joseph and Associates.2004.*FINAL ENVIRONMENTAL IMPACT REPORT FOR THE CANYON HILLS PROJECT*, Prepared for the City of Los Angeles

County of Los Angeles, Department of Regional Planning.2006.*The Verdugo Mountains SEA Description*,Los Angeles County, California.

Dale, N.1986.Flowering Plants:The Verdugo Mountains, Coastal & Chaparral Regions of Southern California.

David Carroll & Associates.1992.*Biological Constraints Analysis Report*, *Project No.91-359*, *SEA No.3 Buffer*, *Latigo Canyon Road*,Los Angeles County, California.

David Carroll & Associates.1991.*Biota Report for Subdivision Parcel Map No.89494 Latigo Canyon*,Los Angeles County, California.

David J.Tanner & Associates.1988.*Biological Resources Assessment and Tree Inventory and Evaluation for Malibu Terrace*, *Tract No.45342 and No.45343*, *SEA No.12*,Los Angeles County, California.

Edelman, Paul.1990 (revised 2/91).*Critical Wildlife Corridor/Habitat Linkage Areas Between the Santa Susana Mountains*, *The Simi Hills and The Verdugo Mountains*,Los Angeles County, California.

Sawyer, Keeler-Wolf and Evens.2009.*A Manual of California Vegetation*, *Second Edition* Sacramento:California Native Plant Society Press.

U.S. Department of the Interior, Fish and Wildlife Service.1998.*Draft Recovery Plan for Six Plants from the Mountains Surrounding the Los Angeles Basin*,Region One, Portland, Oregon.

Coastal Resource Area Descriptions

The following are detailed descriptions of each of the nine Coastal Resource Areas:

Alamitos Bay CRA

Location

General

The Alamitos Bay Coastal Resource Area (CRA) is located upstream of the Alamitos Bay Marina, off the Los Cerritos Channel of the City of Long Beach. The CRA boundaries encompass the Alamitos Bay salt marsh, which is one of three remaining examples of salt marshes found in the County. The entire CRA area has been identified by the California Audubon as a Globally Important Bird Area (IBA)—part of the Los Cerritos Wetlands and adjacent oil fields section of the Orange Coast Wetlands unit. The entire CRA is located within the United States Geological Survey (USGS) 7.5' California Los Alamitos Quadrangle.

General Boundary and Resources Description

The CRA boundaries generally follow the Alamitos Bay salt marsh area, which is bordered by an oil field, main artery roads, the Cerritos Channel, and residential development. The CRA is situated to the west of Studebaker Road, north of Westminster Avenue, east of Pacific Coast Highway and south of Loynes Drive and the Cerritos Channel within the City of Long Beach.

The CRA is one of three remaining examples of salt marsh found in the County, and the last remnant of the extensive salt marshes once found in Los Alamitos Bay. The majority of this vegetation type has been lost to urbanization, flood control projects, harbors, and marinas. It is one of the most productive ecological communities and is an important breeding ground for terrestrial and marine organisms, including the majority of commercial fishes. This is due in part to the estuaries and salt marshes interfacing between the terrestrial and marine worlds, and serving as important nutrient cycling centers for marine ecosystems. The Belding's savannah sparrow occurs in Alamitos Bay salt marsh. This species is restricted to salt marsh habitat, and has been placed on the state-endangered species list. The Orange Coast Wetlands IBA is believed to harbor one-eighth of the population of Belding's savannah sparrows, and there is a significant amount in Alamitos Bay. Least terns and other terns that breed in the area often use Alamitos Bay and the Cerritos arm as a foraging area. This type of habitat is an important wintering ground for migratory birds. It is estimated that in the fall and spring seasons, the Orange Coast Wetlands IBA hosts 15,000-20,000 individual migrating birds.

Vegetation

As discussed, the CRA encompasses the last remaining coastal salt marsh in Los Alamitos Bay's

formerly extensive system of salt marshes and is one of only three such examples of this habitat remaining in County. Sensitive plant species occurring or potentially occurring within the CRA are discussed in the Sensitive Biological Resources section.

Coastal Salt Marsh: Consists of salt-tolerant plants that are mostly low-growing herbaceous perennials that are found on the borders of marine salt water bodies. The duration and extent of tidal inundation or influence causes a graduation in the prevalence of various species within this community. In the Alamitos Bay wetlands, this includes cordgrass as the dominant species and depending on the conditions, pickleweed, salt grass, alkali heath and spearscale can also be found.

Corresponding MCV communities:

- Sarcocornia pacifica (Salicornia depressa) ([Salicornia pacifica, Salicornia depressa] pickleweed mats) Herbaceous Alliance
- Bolboschoenus maritimus (salt marsh bulrush marshes) Herbaceous Alliance
- Distichlis spicata (salt grass flats) Herbaceous Alliance
- Spartina foliosa (California cordgrass marsh) Herbaceous Alliance

Intertidal Flats: Brackish coastal wetlands of low-lying basins of high evaporation and infrequent inputs of freshwater with low-growing salt tolerant plants.

Corresponding MCV Communities:

- *Ruppia* (*cirrhosa, maritima*) (ditch-grass or widgeon-grass mats) Aquatic Herbaceous Alliance

Wildlife

Coastal salt marshes and estuaries are productive habitats, which are used for foraging and breeding grounds, for both resident and migrating wildlife species. Estuaries and coastal salt marshes are the interface between the terrestrial and marine worlds, and are important nutrient recycling centers for marine ecosystems. In the past, this habitat was once extensive in the Los Alamitos Bay area.

Although little documentation regarding the types of animals present has been found, based on the apparent health of the ecosystem, it may be assumed that fishes that are commonly found in the vicinity can also be found in the CRA. These may include species, such as arrow goby, California halibut, cheekspot goby, diamond turbot, queenfish, shadow goby, shiner perch, topsmelt, longjaw mudsucker, Pacific staghorn sculpin,and yellowfin goby.

Without more information, it is not possible to predict whether any reptiles or mammals can be found, but it is likely that amphibians, such as Baja California chorus frogs, are present.

The CRA habitat probably supports a variety of bird species found in the few coastalsaltmarshes that remain in coastal Southern California. Belding's savannahsparrow has been observed in the CRA. Shallow water habitat exists and would be expected to attract wading birds and ducks. Foraging habitat that is attractive to raptors appears to be present on the outside perimeter of the marsh.

Wildlife Movement

The CRA provides a variety of saltwater, estuarine, mudflat and freshwater marsh habitats, and is an important stopover for many migratory birds traveling the Pacific Flyway migration route. Its suitability for many fishes and invertebrates allows populations that are capable of supporting further colonization and expansion of range. The area does not fall within any identified terrestrial movement routes for wildlife.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare. This is due to the species' declining or limited population sizes, which usually results from habitat loss. Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS). The following sections indicate the habitats as well as plant and animal species present, or potentially present within the CRA, which have been accorded special recognition.

Sensitive Plan Communities and Habitats

The CRA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011]. The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species. The CRA is configured to encompass the regionally significant community of a coastal salt marsh or coastal brackish marsh. This community or closely related designations are considered highest priority communities by the ~~CDFG~~CDFW, indicating that they are declining in acreage throughout their range due to land use changes. The array and composition of these communities have been discussed in the Vegetation section. Changes to the classification system mentioned earlier in some cases divide plant communities into many possible vegetation alliances—not all of which may be considered sensitive. Previously listed communities with at least one sensitive alliance in the new format have been listed.

Sensitive Plant Species

The following special-status plant taxa have been reported or have the potential to occur within the CRA, based on known habitat requirements and geographic range information:

- Davidson's saltscale (*Atriplex serenana var. davidsonii*) RPR 1B.2
- Southern tarplant (*Centromadia parryi ssp. australis*) RPR 1B.1
- Salt marsh bird's-beak (*Chloropyron maritimum ssp. maritimum*) FE, SE, RPR 1B.2
- Coulter's goldfields (*Lasthenia glabrata ssp. coulteri*) RPR 1B.1
- Coast woolly-heads (*Nemacaulis denudata var. denudata*) FT, RPR 1B.1

- California Orcutt grass (*Orcuttia californica*) FE, SE, RPR 2.1
- Estuary seablite (*Suaeda esteroa*) RPR 1B.2
- San Bernardino aster (*Symphyotrichum defoliatum*) RPR 1B.2

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the CRAbasedon habitat requirements and known range attributes:

- Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) SE
- California least tern (*Sternula antillarum browni*) FE, SE, ABC, ~~CDFG~~CDFW Fully Protected

CRARegional Biological Value

The CRA meets several SEA designation criteria and supports many regional biological values. Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE ALAMITOS BAY CRA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	Los Alamitos Bay is one of only three remaining salt marshes found in the County, and a remnant of extensive salt marshes once found in its area. (The others are the Ballona Wetlands off of Santa Monica Bay and the Malibu Lagoon.) It is the type habitat of Belding's savannah sparrow, which is an endangered species, that is still found in the much reduced habitat of the salt marshes of Southern California.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	Salt marsh is reduced and fragmented from its former coverage in Southern California, so it is important to preserve any of these important estuarine areas.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	Los Alamitos Bay is one of only three remaining salt marshes found in the County, which is a remnant of extensive salt marshes once found in the area.
	Habitat that at some point in the life cycle of a species or group of species, serves as		The Belding's savannah sparrow lives its entire life in salt marshes and breeds, rests, and feeds in this area. Salt marshes are important nursery grounds for many marine animals, and diminished fisheries

Criterion		Status	Justification
D)	concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	for many are attributed to the loss of salt marshes. Salt marshes are important habitat for migrating marine birds, which utilize the abundant forage produced by the marsh in the form of mud animals and insects.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	As one of only three salt marshes in the County, this area is scientifically interesting for the study of island bio-geography in that salt marshes are now islands, whereas they were once almost continuous in the seismically active coastline of Southern California. The three marshes differ from one another in dominant vegetation.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Los Alamitos Bay is one of only three remaining salt marshes found in the County, which is a remnant of extensive salt marshes once found in its area. The majority of this habitat type has been lost to urbanization, flood control projects, harbors, and marinas. Salt marshes are a very productive vegetative community and an important breeding and nursery area for marine, marsh, and terrestrial animals—an ecotone where multiple habitats meet and combine resident biota. Many commercially valuable fishes start life in salt marshes.

In conclusion, the area described in this report is a CRA because it contains: A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; and D) concentrated breeding, feeding, resting, or migrating grounds that are limited in availability in the County; E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community; and F) areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.

BallonaWetlands CRA

Location

General

The BallonaWetlands Coastal Resource Area (CRA) is located south of Marina Del Rey, north of Playa Del Rey, and west and northwest of Playa Vista. One extending arm reaches north to the State Route-90 overcrossing and another reaches south to include the restored freshwater marsh adjacent to the Playa Del Rey and Playa Vista districts of the City of Los Angeles. The Ballona Wetlands are a remnant of what was the County's largest coastal lagoon. The Ballona watershed covers over 130 square miles, and the lagoon area was so large (about 11-12 square miles) that it included freshwater peripheries. Incorporated in the lagoon complex were 10 kinds of habitat that

ranged from coastal saltwater marsh to grassy prairie to oak and willow woodland adjacent to freshwater areas. The lagoon connected via Ballona Creek that sometimes was the Los Angeles River, to La Cienega, a large swampy area (about 13-14 square miles) that was north and east of the Baldwin Hills. The CRA lies at the base of the Ballona Creek watershed and includes part of the Ballona Creek flood control channel that drains the total of 130 square miles, from what is now a highly urbanized area. While the Ballona Wetlands ecosystem has been substantially degraded over the years due to human activity and urban development, it is still a rich ecological system that bridges the gap between aquatic marine and freshwater land environments. It provides crucial habitat for hundreds of plant and animal species.

The CRA is in part of the California Audubon-designated Ballona Wetlands State Important Bird Area (IBA). The IBA is more extensive than the CRA, and includes all of the Marina Del Rey waterways, some of the Strand Beach to the south, Del Rey Lagoon and Ballona Lagoon, and extends up the Bluff Creek (source creek for the restored freshwater marsh) at the base of the south Ballona bluff as far as Centinela Avenue. This area is very important to avian life and has a great diversity of bird types ranging from those associated with salt water marsh to those associated with freshwater marsh to raptors that feed over grasslands.

The CRA is located on unincorporated land in the community of Marina Del Rey north of the Ballona Creek Channel and in the City of Los Angeles south of the Ballona Creek Channel. It is within the United States Geological Survey (USGS) 7.5' California Venice Quadrangle.

General Boundary and Resources Description

The CRA is surrounded by urban and residential uses. The CRA is bordered by Fiji Way in Marina Del Rey on the northeast, and has an arm that extends northeast to the State Route-90 overcrossing. This arm includes an undeveloped area of mixed native and non-native shrubs and grasses, and is bordered by Culver Boulevard on its south edge. The north boundary crosses the Ballona Creek Channel directly south of the end of Fiji Way, and goes west on the south side of Ballona Creek, which delineates the CRA's western half. The boundary turns southward, then eastward at the development in Playa Del Rey. The boundary goes north to Jefferson Boulevard along a gas line road, and then continues eastward on the north side of Jefferson Boulevard, as far as the area that has been restored as a freshwater marsh. The boundary turns southward and eastward to enclose the freshwater marsh. At the boundary of the freshwater marsh along Lincoln Boulevard, the boundary follows the west side of Lincoln Boulevard crossing Jefferson Boulevard, Ballona Wetlands, and connecting to the south side of the north arm where it crosses Culver Boulevard. Most of the area is a mixture of native and non-native shrubs and grasses, with a strong influence of brackish conditions. The northern side of the Ballona Creek Channel was a tidal mud flat in the original Ballona Lagoon that received a large amount of the dredge spoil when Marina Del Rey was created. However, there is enough natural forage in the wetlands to sustain a breeding colony of great blue herons and a breeding colony of black-crowned night herons in the trees of nearby Marina Del Rey.

Ballona Wetlands is one of three remaining remnants of salt marsh in the County (the other two are Malibu Lagoon in the Santa Monica Mountains SEA and the Cerritos Channel salt marsh in the Alamitos Bay CRA). This type of habitat is one of the most productive in the world, and is used as a breeding ground by many marine and terrestrial organisms. Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), which is a state-recognized endangered species, resides in

the pickleweed flats on the south side of the Ballona Wetlands. The California least tern (*Sternula antillarum browni*) breeds in the sandy areas around Ballona Lagoon and on Venice Beach, and is recognized as an endangered species by the state and federal governments. The terns forage in the waterways that are included in the CRA.

The salt marsh, Ballona Creek Channel, Ballona Lagoon, and Del Rey Lagoon form an important complex of habitats that are heavily used by migratory birds. The area is recognized by ornithologists and bird watchers throughout the area for its rich birdlife during the spring and fall migrations, and during the winter season. This type of heavy use is common in salt marsh habitat, and has been made more intense by the loss of habitat in Marina Del Rey, and throughout most of Southern California. This forces these birds to concentrate in the few remaining areas. Loss of this habitat type has led to reductions in the numbers of these birds present along the coast.

The salt marsh and lagoon at Ballona Creek are heavily used by academic institutions and conservation groups for educational field trips. This area serves as a type specimen of salt marsh habitat, and is the only easily accessible example in the County.

Vegetation

There are two categories of habitat in the CRA: wetland and upland altered or created by filling and grading. The wetland is characterized by coastal salt marsh and freshwater marsh. The upland is represented by a disturbed coastal sage scrub, non-native annual grassland, and coastal bluff and dune scrub. Sensitive plant species occurring or potentially occurring within the CRA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the CRA are given below.

Coastal Salt Marsh:Consists of salt tolerant plants that are mostly low-growing herbaceous perennials found on the borders of marine salt water bodies. The duration and extent of tidal inundation or influence causes a graduation of various species prevalence within this community. In the Ballona Wetlands this includes the areas where pickleweed (*Salicornia pacifica*) is a dominant species and depending on the conditions other plants such as California cordgrass (*Spartina foliosa*), salt grass (*Distichlis spicata*), alkali heath (*Frankenia salina*) and spearscale (*Atriplex prostrata*) can be found.

Corresponding MCV communities:

- Sarcocornia [Salicornia] pacifica (Salicornia depressa) (pickleweed mats) Herbaceous Alliance
- Bolboschoenus maritimus (salt marsh bulrush marshes) Herbaceous Alliance
- Distichlis spicata (salt grass flats) Herbaceous Alliance
- Spartina foliosa (California cordgrass marsh) Herbaceous Alliance

Intertidal Flat: Brackish coastal wetlands of low-lying basins of high evaporation and infrequent inputs of freshwater with low-growing salt tolerant plants.

Corresponding MCV Communities:

- *Ruppia* (*cirrhosa*, *maritima*)(ditch-grass or widgeon-grass mats) Aquatic Herbaceous Alliance

Freshwater Marsh: Develops in areas of still or slow-moving permanent freshwater. In the CRA, this community may be dominated by perennial, emergent cattails (*Typha* spp.), which reach a height of four to five meters and often form a closed canopy. Bulrushes (*Schoenoplectus* spp.) are dominant below the cattail canopy. Freshwater marsh is relatively uncommon; it occurs in small patches in natural or created sinks with water sources.

Corresponding MCV communities:

- *Lepidium latifolium* (perennial pepper weed patches) Semi-Natural Herbaceous Stands
- *Schoenoplectus californicus* (California bulrush marsh) Herbaceous Alliance
- *Typha* (*angustifolia*, *domingenis*, *latifolia*)(cattail marshes) Herbaceous Alliance
- *Sarcocornia* [*Salicornia*] *pacifica* (*Salicornia depressa*) (pickleweed mats) Herbaceous Alliance
- *Juncus articus* (var. *balticus, mexicanus*) [*Juncus balticus* ssp. *ater*, *J. mexicanus*] (Baltic and Mexican rush marshes) Herbaceous Alliance
- *Juncus effusus* (soft rush marshes) Herbaceous Alliance
- *Lemna (minor)* and relatives (duckweed blooms) Provisional Herbaceous Alliance

Coastal Sage Scrub: Occurs in Southern California where moisture is available in the upper horizons during the winter-spring growing season. Plants that are adapted to these conditions are a mixture of herbaceous and weakly woody, shrubby and drought deciduous types. This includes species such as California sagebrush (*Artemisia tridentata*), coyote brush (*Baccharis pilularis*) and laurel sumac (*Malosma laurina*).

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub)Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum cinereum* (ashy buckwheat scrub) Shrubland Alliance

- *Eriogonum fasciculatum* (California buckwheat scrub)Shrubland Alliance
- *Hazardia squarrosa* (sawtooth golden bush scrub)Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub)Shrubland Alliance
- *Lupinus albifrons* (silver bush lupine scrub)Shrubland Alliance

Coastal Bluff and Dune Scrub: A remnant of the El Segundo Dune system that occupied coastal areas along much of the Santa Monica Bay. The system consists of fine, sandy soil that dries rapidly. Plants typical of the dune scrub include dune buckwheat (*Eriogonum parvifolium*), rattle pod (*Astragalus trichopodus var. lonchus*), bladderpod (*Peritoma arborea*), deer weed (*Acmispon glaber*), sawtooth goldenbush (*Hazardia squarrosa*), and California sunflower (*Helianthus californicus*)

Corresponding MCV communities:

- *Baccharis pilularis* (coyote brush scub) Shrubland Alliance
- *Lupinus arboreus* (yellow bush lupine scrub) Shrubland Alliance and Semi-Natural Shrubland Stands
- *Lupinus chamissonis-Ericameria ericoides* (silver dune lupine–mock heather scrub) Shrubland Alliance

Non-native Grassland Communities:Consist of low, herbaceous vegetation that are dominated by invasive grasses that are primarily of Mediterranean origin, but can also harbor native forbs and bulbs, as well as naturalized annual forbs. Species found within this community include wild oat (*Avena fatua*), slender oat (*Avena barbata*), red brome (*Bromus madritensis ssp. rubens*), ripgut brome (*Bromus diandrus*), and herbs such as black mustard (*Brassica nigra*) and wild radish (*Raphanus raphanistrum*). This community can be found throughout the CRA, but are less common in the moist soils found in and close to the salt and fresh water marshes.

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*)Semi-Natural Herbaceous Stands
- *Brassica* (*nigra*)and other mustards Semi-Natural Herbaceous Stands
- *Bromus* (*diandrus*, *hordeaceus*)-*Brachypodium distachyon* Semi-Natural Herbaceous Stands
- *Bromus rubens-Schismus (arabicus, barbatus)* ([*Bromus madritensis* ssp. *rubens*] red brome or Mediterranean grass grasslands)Semi-Natural Herbaceous Stands
- *Centaurea (solstitialis, melitensis)* (yellow star-thistle fields) Semi-Natural Herbaceous Stands
- *Lolium perenne* [*Festuca perennis*](perennial rye grass fields) Semi-Natural Herbaceous Stands

Wildlife

Coastal salt marshes are productive habitats that are used for foraging and breeding grounds, for both permanent resident and migrating wildlife species. The CRA is an important site due to the rarity of this type of habitat, which was once more extensive in Southern California.

Studies in the last 30 years in the vicinity have identified a total of 44 species of fishes. Types found include arrow goby (*Clevelandia ios*), California halibut (*Paralichthys californicus*), cheekspot goby (*Ilypnus gilberti*), diamond turbot (*Hypsopsetta guttulata*), queenfish (*Seriphus politus*), shadow goby (*Acentrogobius nebulosus*), shiner perch (*Cymatogaster aggregata*), topsmelt (*Atherinops affinis*), longjaw mudsucker (*Gillichthys mirabilis*), Pacific staghorn sculpin (*Leptocottus armatus*),and yellowfin goby (*Acanthogobius flavimanus*).

Many native species of reptiles and amphibians have been found in the CRA. These include common kingsnake, San Diego gopher snake (*Pituophis catenifer annectens*), western side-blotched lizard (*Uta stansburiana elegans*), San Diego alligator lizard (*Elgaria multicarinata webbii*), Great Basin fence lizard (*Sceloporus occidentalis longipes*), California slender salamander (*Batrachoseps attenuatus*) and California legless lizard (*Anniella pulchra*). Baja California chorus frog (*Pseudacris hypochondriaca*) and California toad (*Anaxyrus halophilus*) are very common in season. No invasive species of amphibians or reptiles have been reported in the CRA.

Native species of mammals found included western harvest mouse (*Reithrodontomys megalotis* (*western harvest mouse*), Botta's pocket gopher (*Thomomys bottae*), desert cottontail (*Sylvilagus audubonii*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), California ground squirrel (*Spermophilus beecheyi*), and the sensitive species south coast marsh vole (*Microtus californicus stephensi*). Invasive species found include house mouse (*Mus musculus*), black rat (*Rattus rattus*), Norway rat (*R. norvegicus*), domestic cat (*Felis domesticus*), Virginia opossum (*Didelphis virginiana*), and domestic dog (*Canis familiaris*). Low populations of small mammals are likely to be due to depredation by introduced red foxes, which are an immediate threat to the continued viability of the Ballona ecosystem.

The Ballona Wetlands provide habitat for a variety of bird species attracted to the few coastal saltmarshes that remain in coastal Southern California. Shallow water habitat for wading birds and ducks occurs in the northwestern portion of the CRA. No deep water is present for diving ducks and other birds that dive from the surface for fish. Foraging habitat for most raptors occurs in the western portion. Many bird species forage in the CRA, and the wetlands are used during migration and nesting. A resident population of Belding's savannah sparrow, which is a state-endangered species, was present in 2006 and the state and federally-endangered California least tern and fully protected American peregrine falcon (*Falco peregrinus anatum*) have been known to forage in this CRA. In 2010, least Bell's vireos (*least Bell's vireo*) successfully nested at the freshwater marsh, and many migrants have been observed there.

Sensitive wildlife species occurring or potentially occurring within the CRA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

The CRA is an important stopover for many migratory birds traveling the Pacific Flyway migration route. For many birds this area, it is important because it provides a variety of salt-water, estuarine,

mudflat and freshwater marsh habitats. It offers many fishes and invertebrates an opportunity to establish populations capable of supporting further colonization to expand their range. The area does not fall within any identified terrestrial movement routes for wildlife.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare. This is due to the species' declining or limited population sizes, which usually results from habitat loss. Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS). The following sections indicate the habitats as well as plant and animal species present, or potentially present within the CRA, which have been accorded special recognition.

Sensitive Plant Communities and Habitats

The CRA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011]. The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species. The CRA is configured to encompass regionally significant communities, which include pickleweed mats, salt marsh bulrush marshes, California cordgrass marsh, ditch-grass or widgeon-grass mats, California brittle bush scrub, ashy buckwheat scrub, sawtooth golden bush scrub, and silver dune lupine–mock heather scrub. These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Changes to the classification system mentioned earlier in some cases divides plant communities into many possible vegetation alliance communities, not all of which may be considered sensitive. For this CRAdescription, previously listed communities with a least one sensitive alliance in the new format have been listed.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system. The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution). In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added: .1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the CRA, based on known habitat requirements and geographic range information:

- Aphanisma (*Aphanisma blitoides*) RPR 1B.1

- Marsh sandwort (*Arenaria paludicola*) RPR FE, SE, 1B.1
- Ventura marsh milk-vetch (*Astragalus pycnostachyus var. lanosissimus*) FE, SE, RPR 1B.1
- South Coast saltscale (*Atriplex pacifica*) RPR 1B.2
- Parish's brittlescale (*Atriplex parishii*) RPR 1B.1
- Davidson's saltscale (*Atriplex serenana var. davidsonii*) RPR 1B.2
- Southern tarplant (*Centromadia parryi ssp. australis*) RPR 1B.1
- Orcutt's pincushion (*Chaenactis glabriuscula var. orcuttiana*) RPR 1B.1
- Coastal goosefoot (*Chenopodium littoreum*) RPR 1B.2
- Salt marsh bird's-beak (*Chloropyron maritimum ssp. maritimum*) FE, SE, RPR 1B.2
- Beach spectaclepod (*Dithyrea maritima*) ST, RPR 1B.1
- Los Angeles sunflower (*Helianthus nuttallii ssp. parishii*) RPR 1A
- Coulter's goldfields (*Lasthenia glabrata ssp. coulteri*) RPR 1B.1
- Mud nama (*Nama stenocarpum*) RPR 2.2
- Gambel's water cress (*Nasturtium gambelii*) FE, SE, RPR 1B.1
- Coast woolly-heads (*Nemacaulis denudata var. denudata*) RPR 1B.2
- Ballona cinquefoil (*Potentilla multijuga*) RPR 1A
- Estuary seablite (*Suaeda esteroa*) RPR 1B.2

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the CRA based on habitat requirements and known range attributes:

- Mimic tryonia (*Tryonia imitator*) ~~CDFG~~CDFW Special Animals List
- Wandering skipper (*Panoquina errans*) ~~CDFG~~CDFW Special Animals List
- Silvery legless lizard (*Anniella pulchra pulchra*) FSS, SSC
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*) ~~CDFG~~CDFW Special Animals List
- San Bernardino ringneck snake (*Diadophis punctatus modestus*) FSS
- Western pond turtle (*Emys marmorata*) BLMS, FSS, SSC

- Two-striped garter snake (*Thamnophis hammondii*) BLMS, FSS, SSC
- Tricolored blackbird (*Agelaius tricolor*) BCC, BLMS, SSC, USBC, AWL, ABC
- Burrowing owl (*Athene cunicularia*) BCC, BLMS, SSC
- Western snowy plover (*Charadrius alexandrinus nivosus*) FT, BCC, SSC, ABC, AWL, USBC
- California black rail (*Laterallus jamaicensis coturniculus*) BCC, ST, ~~CDFG~~CDFW Fully Protected, USBC, AWL, ABC
- Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) SE
- California least tern (*Sternula antillarum browni*) FE, SE, ~~CDFG~~CDFW Fully Protected, USBC, ABC
- Vireo bellii pusillus (*least Bell's vireo*) FE, SE, ABC
- South coast marsh vole (*Microtus californicus stephensi*) SSC
- Pacific pocket mouse (*Perognathus longimembris pacificus*) FE, SSC
- Southern California saltmarsh shrew (*Sorex ornatus salicornicus*) SSC

Regional Biological Value

The CRA meets several SEA designation criteria and supports many regional biological values. Each criterion and how it is met is described below.

Criteria Analysis of the Ballona Wetlands CRA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	Least Bell's vireos are beginning to use the restored freshwater marsh component for breeding. Given time, this could become one of the important breeding areas for them in the coastal area. Belding's savannah sparrow lives in the salt marsh savannah. Least terns breed nearby and forage year round in the shoal water areas of the CRA.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	There are three remaining salt marsh areas in the County: Cerritos Marsh in the Alamitos Bay CRA, Malibu Lagoon, and the CRA. In addition, there is a restored freshwater marsh on the periphery of Ballona Wetlands. The union of these two habitats is very rare in Southern California.
C)	Within the County, biotic communities, vegetative associations, and habitat of	Met	There are three remaining salt marsh areas in the County: Malibu Lagoon, the marsh in Alamitos Bay CRA,

	plant or animal species that are either unique or are restricted in distribution		and CRA. In addition there is a restored freshwater marsh on the periphery of Ballona Wetlands. Salt marsh coupled with freshwater marsh, is very rare in the County. There is no other such representation in the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	Endangered least Bell's vireos are using the freshwater marsh for breeding—they do not commonly occur in saltwater marshes, but were probably common on the peripheries in the freshwater portions. This restoration returns some of the former diversity and adds an important area for breeding. Many commercially valuable marine fishes start life in salt and estuarine marsh areas. The Ballona Wetlands are an important stopover point for migrations on the Pacific Flyway.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The union of the salt marsh and freshwater marsh habitats has no other representation in the County and is therefore of great scientific interest. As the only easily accessible saltwater marsh, the Ballona Wetlands have great educational value. This kind of ecotone is usually in very short supply, and will always be an extreme kind of physical habitat, a meeting point for the coastal strand, the brackish area of the marsh, and the freshwater area of the upland.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	NotMet	Without implementation of restoration activities, this CRA does not provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.

In conclusion, the area is a CRA because it contains: A) habitat that hosts breeding for the endangered least Bell's vireo; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are unique and are restricted in distribution in the County and regionally; and D) concentrated breeding, feeding, resting, and migrating grounds, which are limited in availability in the County; and E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community

El Segundo Dunes CRA

Location

General

The El Segundo Dunes Coastal Resource Area (CRA) is located between the west end of the Los Angeles International Airport (LAX) and the Pacific Ocean. The CRA is the largest remaining coastal dune habitat in Southern California. The federally-endangered El Segundo blue (*Euphilotes battoides allyni*) butterfly lives its entire life in these dunes.

The entire CRA is located in the United States Geological Survey (USGS) 7.5' California Quadrangle

of Venice.

General Boundary and Resources Description

The CRA boundaries are as follows: Sandpiper Street to the north, Pershing Drive to the east, Imperial Highway to the south, and Vista Del Mar Road to the west. This is the largest of four proposed critical habitat areas for the El Segundo blue butterfly. The Vista Del Mar Park on Vista Del Mar Road is excluded from the CRA.

The ecological significance of the El Segundo Dunes is recognized by both federal and state governments, as well as by the City and County of Los Angeles and the California Coastal Commission (CCC). The vegetation found here does not occur anywhere else in the County, and is uncommon throughout Southern California. The vegetation is southern dune scrub, which is adapted to sandy, well-drained soils. The vegetation shows zonation, changing gradually as one moves from the foredunes facing west and the ocean over the dune crest and into coastal sage scrub. Many plants and invertebrates are specifically adapted and restricted to this environment and are not found elsewhere. One of these endemic organisms is the El Segundo blue butterfly, a federally-endangered butterfly species. The distribution of this butterfly is entirely restricted to the El Segundo Dunes and a few specks of dune habitat south to the edge of Malaga Cove (all once part of the El Segundo Dune sysytem). Because of its rarity and highly limited range, the butterfly is officially recognized as an endangered species by the U.S. Fish and Wildlife Service. This small piece of dune habitat is extremely valuable as the final example of a community that was once more common along the County and Southern California coastline.

Vegetation

Vegetation within the CRA is a remnant of a formerly more widespread distribution in the Los Angeles area of plant communities defined by their proximity to the immediate coast with its unique environmental conditions and sandy soils. The area has a long history of land disturbance and increasing isolation from related habitats. Today, the CRA has three plant communities with relatively few species. Importantly, the dune buckwheat (*Eriogonum parvifolium*), which is the only host plant for the larvae of the rare El Segundo blue butterfly, is found there, and the buckwheat population is isolated from other populations. Sensitive plant species occurring or potentially occurring within the CRA are discussed in the Sensitive Biological Resources section.

Descriptions and general locations of the each plant community present within the CRA are given below.

Coastal Strand Vegetation:A community that occurs in the loose sand just above the high tide line of the beach. This community is characterized by a low species diversity because few plants can tolerate the harsh conditions on this dry, sandy, saline soil with buffeting by high winds, salt spray and high summer temperatures.

Corresponding MCV communities:

- Abronia latifolia – Ambrosia chamissonis (dune mat) Herbaceous Alliance
- Cakile (edentula, maritima) (sea rocket stands) Semi-Natural Provisional Herbaceous Alliance

Coastal Bluff and Dune Scrub:A remnant of the El Segundo Dune system that occupied coastal areas along much of the Santa Monica Bay. In the CRA, the coastal bluff and dune scrub is found in a strip along the immediate coastal sections of the CRA. The system consists of fine, sandy soil that dries rapidly. Plants typical of the dune scrub include dune buckwheat (*Eriogonum parvifolium*), rattle pod (*Astragalus trichopodus* var. *lonchus*), bladderpod (*Peritoma arborea*), deer weed (*Acmispon glaber*), sawtooth goldenbush (*Hazardia squarrosa*), and California sunflower (*Helianthus californicus*).

Corresponding MCV communities:

- *Baccharis pilularis* (coyote brush scrub) Shrubland Alliance
- *Lupinus arboreus* (yellow bush lupine scrub) Shrubland Alliance and Semi-Natural Shrubland Stands
- *Lupinus chamissonis-Ericameria ericoides* (silver dune lupine–mock heather scrub) Shrubland Alliance

Coastal Sage Chaparral Scrub:Characterized by the summer drought deciduous vegetation found near the Southern California coast of low, mostly soft-woody shrubs with bare ground underneath and between shrubs. This community is dominated by California sagebrush, California buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), purple sage (*Salvia leucophylla*), and California brittle bush (*Encelia californica*) and intergrades with the coastal bluff and dune scrub near the shore and gradually becomes more evident near the crest of the site

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Hazardia squarrosa* (sawtooth golden bush scrub) Shrubland Alliance
- *Lotus scoparius* [*Acmispon glaber*](deer weed scrub) Shrubland Alliance
- *Lupinus albifrons* (silver bush lupine scrub) Shrubland Alliance

Wildlife

An assessment of wildlife is made difficult due to the lack of data but the animal populations within the CRA probably reflect a somewhat lower diversity and abundance for the habitat types present for several reasons, including: the small area of the dune habitat, the homogeneity of the topography and habitat, influences of edge effect from developments to the north and south, the ocean to the west and the impact of being under the flight paths of aircraft departing from LAX to the east.

One key occupant of the area is the El Segundo blue butterfly, which is found here and also in a very few other locations to the south in remnants of the former dune complex. The El Segundo blue butterfly co-occurs with the only known plant species that supports its complete lifecycle, the dune buckwheat (*Eriogonum parvifolium*). The adult butterfly uses the flowers as a major source of nectar, and the larvae feed only on the flowers and seeds.

Amphibian populations are generally scarce in beachfront communities and no riparian habitat is available within the CRA. Many essential reptilian habitat characteristics, such as open habitats that allow free movement and high visibility and small mammal burrows for cover and escape from predators and extreme weather, are present within the CRA. The scrubland habitats in the CRA probably provide foraging and cover habitat for year-round resident and seasonal resident song birds. In addition, the CRA provides some raptor foraging habitat, so they can be expected visitors. Mammal populations probably reflect the generally disturbed environs influencing this CRA. Small mammals are expected to be uneven in their diversity, with more adaptive species and introduced European species occurring in higher numbers compared to others. Medium sized mammal populations are expected to exhibit the same characteristics. Resident large mammals are absent.Sensitive wildlife species occurring or potentially occurring within the CRA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

The CRA is on the Pacific Flyway migration route used by many birds seasonally. The dune habitat probably does not play an important role as a stopover because of its limited resources, due its small size; however, it will attract some birds because it is one of the few undeveloped places along the coast. The area does not fall within any identified terrestrial movement routes for wildlife.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare. This is due to the species' declining or limited population sizes, which usually results from habitat loss. Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS). The following sections indicate the habitats as well as plant and animal species present, or potentially present within the CRA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas." Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species. However, for species listed previous to 1978, critical habitat areas rarely are designated officially. Sometimes such areas are called "essential habitat," which would be the case here for the El Segundo blue butterfly.

Sensitive Plant Communities and Habitats

The CRA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011]. The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species. These include dune mat, silver dune lupine–mock heather scrub, California brittle bush scrub, and sawtooth golden bush scrub. These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system. The initial category level of Rare Plant Rank is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in California and elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution). In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added: .1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the CRA, based on known habitat requirements and geographic range information:

- Aphanisma (*Aphanisma blitoides*)RPR 1B.1
- Coastal dunes milk-vetch (*Astragalus tener* var. *titi*)FE, SE, RPR 1B.1
- Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*)RPR 1B.1
- Beach spectaclepod (*Dithyrea maritima*)ST, RPR 1B.1
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)RPR 1B.1
- Brand's star phacelia (*Phacelia stellaris*)FC, RPR 1B.1

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the CRA based on habitat requirements and known range attributes:

- Belkin's dune tabanid fly (*Brennania belkini*)~~CDFG~~CDFW Special Animals List
- Busck's gallmoth (*Carolella busckana*)~~CDFG~~CDFW Special Animals List
- Sandy beach tiger beetle (*Cicindela hirticollis gravida*)~~CDFG~~CDFW Special Animals List
- Senile tiger beetle (*Cicindela senilis frosti*)~~CDFG~~CDFW Special Animals List

- Globose dune beetle (*Coelus globosus*)~~CDFG~~CDFW Special Animals List
- Henne's eucosman moth (*Eucosma hennei*)~~CDFG~~CDFW Special Animals List
- El Segundo blue butterfly (*Euphilotes battoides allyni*)FE, Xerces: Critical
- Lange's El Segundo Dune weevil (*Onychobaris langei*)~~CDFG~~CDFW Special Animals List
- El Segundo flower-loving fly (*Rhaphiomidas terminatus terminatus*)~~CDFG~~CDFW Special Animals List
- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*)~~CDFG~~CDFW Special Animals List
- San Bernardino ringneck snake (*Diadophis punctatus modestus*)FSS
- Coast horned lizard (*Phrynosoma blainvillii*)BLMS, FSS, SSC
- Western snowy plover (*Charadrius alexandrinus nivosus*)FT, BCC, SSC, ABC, AWL, USBC
- California black rail (*Laterallus jamaicensis coturniculus*)BCC, ST, ~~CDFG~~CDFW Fully Protected, USBC, AWL, ABC
- California least tern (*Sternula antillarum browni*)FE, SE, ~~CDFG~~CDFW Fully Protected, USBC, ABC
- Pacific pocket mouse (*Perognathus longimembris pacificus*)FE, SSC

Regional Biological Value

The CRA meets several SEA designation criteria incorporating regional biological values. Each criterion and how it is met is described below.

Criteria Analysis of the El Segundo Dunes CRA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	The El Segundo Dunes is one of four known localities in the world where one can find the endangered El Segundo blue butterfly. All four areas are remnants of a once continuous three-mile system of seacoast dunes in the County. The blue's habitat is the coastal dune buckwheat, on which the butterfly lays its eggs and the larvae feed.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either	Met	The southern dune scrub vegetation has become very uncommon in the Southern California region due to the conversion of the habitat to seacoast dwellings, hotels, and other development. The vegetation thrives on sandy,

	unique or are restricted in distribution.		well-drained soils, and grades into coastal sage scrub on the inland side. Many plants and invertebrates are restricted to this environment and are not found elsewhere. This small piece of dune habitat is extremely valuable as the final example of a community that was once more common along the Southern California coast.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Met	The southern dune scrub vegetation found here on the three remnant localities of the El Segundo Dunes does not occur anywhere else in the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	A number of organisms call the sandy, well-drained soils of the El Segundo Dunes “home,” and are restricted to this coastal environment. Like the El Segundo blue butterfly, their entire life cycles are here in thedunes.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	As a result of the uniqueness of this community and of the specializations of the organisms found here, the dunes have been closely scrutinized by biologists of many disciplines.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	NotMet	Much of the original threemiles of dunes have been removed by development or disturbed. Scattered on the site are radio towers, roads, oil extraction equipment, and a reservoir. The vegetation is much impacted by human use, but can be restored. The designated area is the best remaining part of the original El Segundo Dunes.

In conclusion, the area is a CRA because it contains: A) core habitat for the federally-endangered El Segundo blue butterfly; B-C) beach dunes, a rare community both regionally and within the County; D) a habitat that is rare and necessary for the life cycle of the El Segundo blue butterfly and other dune insects and fauna; and E) the geographic limit of El Segundo Dunes, a rare habitat much studied by biologists.

Malibu Coastline CRA

Location

General

The Malibu Coastline Coastal Resource Area (CRA) is located in the shoreline and offshore coastal area of Malibu, which is adjacent to the Santa Monica Mountains. The CRA supports significant areas of aquatic plant and other subtidal communities, which provide habitat for a variety of fishes, birds, marine mammals, and other wildlife. Rocky outcrops intermixed with sandy spaces are found to a depth of 600 feet, and the nearshore area down to about 100 feet depth is considered the most productive and dynamic of all the marine communities outside the tropics. All of the many offshore

rocks within 12 nautical miles of the coast are part of the California Coastal National Monument that is managed by the Bureau of Land Management in the U.S. Department of the Interior.

The site is located in the Triunfo Pass, Point Dume, Malibu and Topanga Quadrangles of the United States Geological Survey (USGS) 7.5 Minute Map Series (USGS, 1964).

General Boundary and Resources Description

The CRA boundary encompasses parts of the shoreline and about a 0.8 mile offshore from Malibu. The CRA stretches between the Ventura-Los Angeles County line at Leo Carillo State Beach, all the way east to Topanga State Beach. The CRA is generally adjacent to the Santa Monica Mountains SEA and Point Dume CRA. Parts of the shore are included along many of the state beaches. The sandy beaches along this CRA are the least disturbed beaches of the County, some of them completely natural. This is the remnant of the typical rock and sand shoreline that once occurred all along the coast of Southern California. From Mugu Lagoon to Latigo Point (the County portion starting at the Ventura-Los Angeles County line), is an Area of Special Biological Significance (ASBS), which is a marine area designated by the State Water Resources Control Board as having exceptionally good water quality and natural community features. Populated and disturbed areas along the shore are largely in the City of Malibu and excluded from the CRA.

This area is a relatively undisturbed coastal region where the upwelling of nutrient-rich waters and a variety of habitats support highly productive and extremely diverse marine communities. The area possesses some of the best kelp bed habitat south of Santa Barbara, and supports the only remaining natural kelp beds off the mainland coast of the County. These kelp bed areas may be one hundred times more productive than adjacent sand bottom communities, and they provide refuge, food, and nursery grounds for thousands of species.

Rocky outcrops alternate with sandy stretches along this coastline and subtidally, outcrops are found to a depth of 600 feet. The stability of the substrate and the variety of exposures provide microhabitats for a great number of organisms. Characteristically, rocky shorelines from the lower intertidal zone to about 100 foot depth can be the most biologically active areas in the world. The adjacent Point Dume CRA is one of the few places that rocky intertidal habitat occurs between Palos Verdes Peninsula and Point Mugu in Ventura County. The rocky tidepools off Point Dume, Big Rock Beach, and the promontory where Topanga Canyon Creek enters the ocean are some of the very best remaining rocky intertidal habitat in the County, and these are within the CRA. The Marine Life Protection Act designated protected area in Malibu to be the Point Dume State Marine Conservation Area (SMCA) between El Matador State Beach west of Point Dume to the west side of Point Dume, which is approximately three miles of coastline, with the conservation area extending in due north-south lines from mean high tide to about three nautical miles offshore. In the SMCA, fishing is restricted to certain species. From the west side of Point Dume to Paradise Cove on the east side is designated as the Point Dume State Marine Reserve (SMR), which has no fishing or other take allowed, and extends in due north-south lines (adjacent to the SMCA on the west) from the intertidal to offshore, which is about three nautical miles.

This coastline possesses the only undisturbed sandy beaches that remain in the County. Although very dynamic in physical stability, there is a biological, subtidal, sand-bottom community that has a great diversity of resident organisms and invertebrates ranging from bacteria through jellyfish, mollusks, and echinoderms, such as seastars, to fishes that habitually choose the sand-bottom substrate. An important micro-community of decomposers is present. Sandy beaches with their

diverse invertebrate communities of interstitial organisms provide feeding areas for many bird species. In addition, the soft substrate offers a repository for eggs and nursery grounds for many species, including the grunion (*Leuresthes tenuis*) that spawns and deposits its eggs in the highest intertidal areas of the sand. This shoreline remains in essentially a native state as a remnant of what once was typical of rock and sand shoreline in Southern California. Artificial modifications have been limited to small local areas. West of Point Dume, some minor pollution does occur, but the kelp is healthy. East of Point Dume there is minor to moderate pollution, and kelp does not grow below 35 feet.

The CRA has critical habitat for the federally-threatened western snowy plover (*Charadrius alexandrinus nivosus*)along Zuma Beach and the northwest sandy area along Point Dume. This will eventually extend along the entire west side of the headland. The western snowy plover will also have critical habitat on the seaside of the barrier berm of the Malibu Lagoon. The snowy plover has over 300 individuals using the beaches of the County for winter roosts, and there is potential for some to over-summer and breed in the County after a hiatus of many decades (Ryan Ecological Consulting, 2010).

Vegetation

The terrestrial component of this marine oriented CRA is limited to the narrow stretch of beach just above the high tide line. Sensitive plant species occurring or potentially occurring within the CRA are discussed in the Sensitive Biological Resources section.

Coastal Strand Vegetation:A community that occurs in the loose sand just above the high tide line of the beach. This community is characterized by a low species diversity because few plants can tolerate the harsh conditions on this dry, sandy, saline soil of high winds, salt spray and high summer temperatures.

Corresponding MCV communities:

- *Abronia latifolia – Ambrosia* spp.(dune mat) Herbaceous Alliance
- *Cakile (edentula, maritima)* (sea rocket stands) Semi-Natural Provisional Herbaceous Alliance

Marine Resources

The Malibu coastline is a relatively undisturbed coastal region where the upwelling of nutrient-rich waters and a variety of habitats support highly productive and extremely diverse marine communities. The area possesses some of the best kelp bed habitat south of Santa Barbara, and the only remaining natural kelp beds on the mainline coast of the County. Rocky outcrops alternate with sandy stretches along this coastline and are found to a depth of 600 feet. This coastline also possesses the only undisturbed sandy beaches remaining in the County.

Surfgrass and Eelgrass Habitats: Characterized by two flowering plants that resemble grass and form dense beds on different substrates and in different conditions. Both types form highly productive habitats for unique assemblages of marine species. NOAA Fisheries and the ~~CDFG~~CDFW consider surfgrass and eelgrass as valuable habitats that should be protected. Surfgrass occurs from Mean Lower Low Water (MLLW) to about 25 feet depth on rocky substrate. Locations known to support substantial surfgrass beds include rocky points and rocky subtidal areas

of canyons all along the northern border of the CRA. Eelgrass grows on soft substrate and typically occurs in bays. A form of eelgrass (thought to be *Zostera pacifica)* is found on open coast sand bottom. Eelgrass is an important habitat that supports a community of diverse species from sessile to mobile invertebrates and certain fishes, such as pipefish. A subtidal eelgrass bed is in the lee of Lechuza Point between about 25 and 45 feet depth, and subtidal eelgrass may still occur off Los Alisos Canyon.

Community dominant plant:

- *Phyllospadix scouleri*, or Scouler's surf grass and *P. torrey* or Torrey's surfgrass
- *Zosterapacifica* (eelgrass)

Intertidal Zone Habitats:Consist of a variety of coastal habitats periodically covered and uncovered by waves and tides. The rocky shores support a rich assortment of plants and animals including green, brown, and red algae. A wide variety of sessile invertebrates compete for space with the plants in this habitat. Mobile invertebrates, such as crabs and snails, can be found in great abundance. Fishes are limited to tidepools, although grunion do spawn and deposit their eggs in the high tide wash areas of sandy beaches. The sandy beaches have a diverse community of interstitial invertebrates. Shorebirds actively forage during low tide in all kinds of shoreline habitats. The federally-endangered black abalone (*Haliotuscracherodii* FE) was once abundant in this habitat all along the rocky coastlines of California. Whether it still persists in the Malibu coastline area is unknown, since its current populations are reduced and much more dispersed than before.

Nearshore Subtidal Habitat:Includes those marine habitats ranging from the lower level of the intertidal zone to 99 feet. This region supports a variety of assemblages of invertebrates and fishes, and in the CRA, this habitat is frequently dominated by giant kelp. Rocky areas have a diverse community of algae (in depths of sufficient light penetration), sessile and mobile invertebrates, and fishes. Subtidal areas are even more diverse than the intertidal areas, and this great variety can be appreciated by the examples of tidepools. There are a variety of subtidal sand-adapted organisms ranging from fishes to seastars, to many kinds of jellyfish, mollusks, and other invertebrates.

Kelp Forest Habitat:Giant kelp beds are located in many places along the CRA to a depth of approximately 99 feet in the ocean. The kelp beds are part of a productive habitat that provide food, attachment sites and shelter for invertebrates and fishes. Giant kelp, the dominant alga of this community, is the fastest lengthening organism known, and it thrives in nutrient-enriched waters of upwelling. It has been “clocked” at two feet per day extension of its stipe and blades. The kelp beds are an important nursery habitat and recruitment area for juvenile fishes and invertebrates. The National Oceanographic and Atmospheric Administration (NOAA) Fisheries as well as the ~~CDFG~~CDFW consider kelp beds as sensitive, and lush kelp beds such as those from the Ventura-Los Angeles County line to Malibu Point are designated as ESHA (Environmentally Sensitive Habitat Areas, Malibu Local Coastal Plan, 1986).

Community dominant plant:

- Macrocystis pyrifera (Giant kelp)

Wildlife

The terrestrial and aerial wildlife found in the CRA is dependent on the two basic regimes found there: marine and shoreline terrestrial. The shoreline beaches and rocky intertidal are home to or visited by a wide variety of shorebirds, migrating birds and marine life. The sandy beaches with their shifting sands present an unstable substrate on which organisms can establish themselves, and their resident wildlife is a set of small specialists that live in the sand interstices. An important microcommunity of decomposers exists, which feed on the materials washed up by the waves.

The Malibu Coastline cliffs, bluffs, offshore rocks and beaches offer many undisturbed habitats for roosting, feeding and nesting by numerous kinds of shore– and seabirds. Sandy beaches provide feeding areas for many species. In addition, the soft substrate offers a repository for eggs and nursery grounds for many species.

The marine habitat has the greatest diversity of wildlife, with representatives from nearly all the phyla (major groupings of animals such as jellyfish, mollusks, echinoderms, etc.) and all parts of the food web (trophic levels) for several communities. Many of the marine phyla do not have terrestrial representatives. Some of the vertebrates, such as gray whales, and the plankton use the area as a migratory corridor. The major vegetation communities, each with its own great diversity and all trophic levels, are the benthic algae of rocky substrates, the kelp beds based on giant kelp holding onto rocky subtidal substrate and extending into the water column, and the planktonic, based on photosynthesizers that are all microscopic.

Sensitive wildlife species occurring or potentially occurring within the CRA are discussed in the Sensitive Biological Resources section of this document.

Wildlife Movement

The CRA is on the Pacific Flyway migration route used by many birds seasonally, This shoreline plays an important role as a stopover because of its extensive undisturbed marine resources. The offshore major part of the CRA is on the annual migration route of the California gray whale (*Eschrichtius robustus*), a CITES Appendix I animal (Convention on International Trade in Endangered Species, endangered status, no trade or harvest except by strictly controlled export and import permits issued in countries that are party to the convention and have legislation of adoption, which includes the U.S.) The gray whale migrates close to shore on its transit during the winter months from the Bering Sea to lagoons of Baja California. This is migration to the Baja lagoons for calving and breeding. The whales generally return north offshore. The area may well be a migration corridor for other marine animals, as this is part of the great Southern California Bight, which has an eddy circling counterclockwise to the north off the southward flow of the California Current. This flow brings marine organisms (fishes, invertebrates, and plants) that may have major population concentrations in the south to this part of their ocean habitat. Most of these organisms have a planktonic stage that is absolutely dependent on the current system to maintain their populations and distribution. Pollution of the ocean waters by development on land will have significant effects that may not be appreciated immediately because of the cryptic nature of subtidal animals and plants.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by

federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare. This is due to the species' declining or limited population sizes, which usually results from habitat loss. Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS). The following sections indicate the habitats as well as plant and animal species present, or potentially present within the CRA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas." Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species. There are two critical habitat areas for the western snowy plover in this CRA.

Sensitive Plan Communities and Habitats

The CRA supports no terrestrial habitat types considered sensitive by resource agencies, but the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) does not list intertidal or subtidal plants in its California Natural Diversity Data Base (CNDDB), 2011). NOAA Fisheries (National Oceanographic and Atmospheric Administration) as well as the ~~CDFG~~CDFW do consider kelp beds as sensitive, and lush kelp beds such as those from the Ventura-Los Angeles County line to Malibu Point are designated as ESHAs by the County's Malibu Local Coastal Plan, 1986.

Kelp beds disappeared off of Palos Verdes Peninsula during the height of pollution by the White Point outfall in the mid 20th century. The Palos Verdes Peninsula's kelp beds are subsequently returning after reduction of pollution, some prodigious planting efforts, and incursion of the motile zoospores from areas like the Malibu coastline. The kelp beds are sensitive to effects like pollution and excessive sedimentation from development. They are one of the most productive communities of the world, and should be treated with care. Any development plan that might impact them, even with indirect effects, deserves scrutiny.

Sensitive Plant Species

NOAA Fisheries as well as the ~~CDFG~~CDFW consider kelp beds as sensitive, and lush kelp beds, such as those from the Ventura-Los Angeles County line to Malibu Point, are designated as ESHA by the Malibu Local Coastal Plan, 1986. The principle structural component of Malibu offshore kelp beds is the giant kelp (*Macrocystis pyrifera*). NOAA Fisheries and the ~~CDFG~~CDFW consider surfgrass a valuable habitat that should be protected. The principle structural component of surfgrass beds is Scouler's surf grass(*Phyllospadix scouleri*) and Torrey's surfgrass (*P. torreyi*).

Sensitive Animal Species

The western snowy plover (*Charadrius alexandrinus nivosus* [FT, CSC]*),* which feeds and resides in the wrack line areas,has designated critical habitat on Zuma Beach from Trancas Canyon to the northwestern side of Point Dume. This is proposed to expand to Point Dume. Critical habitat is also proposed to include Malibu Beach from Malibu Point to an area east of the pier, which is the seaward side of Malibu Lagoon. The Malibu Lagoon is part of the Santa Monica Mountains SEA, and the CRA is contiguous with the Santa Monica Mountains SEA at the barrier berm of the Lagoon.

The southern steelhead (*Oncorhynchus mykiss irideus* [FE, CSC]) lives in the oceanic and coastal waters for most of its life and uses the coastal streams for breeding and the first year of its young

fish's lives. After one to two years in fresh water, the young fish change to smolts and make their run to the ocean, where they spend the majority of their lives. The lower Arroyo Sequit and its West Fork is designated critical habitat for the southern steelhead. This area has naturally occurring spawning beds and young fish habitat. The coastal ocean waters are within this CRA, and the linkage paths from the ocean to the coastal streams are within this CRA. The southern steelhead is known to currently use the Arroyo Sequit, Malibu Creek, and Topanga Canyon. Historically the steelhead was known from Solstice and Zuma canyons, and was probable in all the major drainages, which once had perennial water and extended to the shore in the rainy season.

The California gray whale (*Eschrichtius robustus* CITES Appendix I) uses this CRA during its calving-breeding migration cycle. The entire order of cetaceae (whales and beaked dolphins) are considered CITES Appendix I by the Australian rating system, the most stringent adoption.

The black abalone (*Haliotis cracherodii*) is a federally-endangered species and critically endangered species of the International Union for Conservation of Nature-Red List (IUCN). At one time, the black abalone was plentiful in the rocky intertidal and nearshore rocky subtidal areas in the CRA, down to about 20 feet depth. Whether it still exists in the CRA is unknown, because its current occurrences are widely scattered and much reduced by overfishing and wasting disease.

- Black abalone (*Haliotis cracherodii*) FE
- Southern steelhead (*Oncorhynchus mykiss irideus)* FE, CSC
- Tidewater goby (*Eucyclogobius newberryi*) FE, SSC
- Western snowy plover (*Charadrius alexandrinus nivosus)* FT, CSC
- California gray whale (*Eschrichtius robustus*) CITES Appendix I

Regional Biological Value

The CRA meets all SEA designation criteria and supports many regional biological values. Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE MALIBU COASTLINE CRA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	California gray whale, tidewater goby, southern steelhead, western snowy plover, and black abalone, all spend critical periods of their life cycles in this CRA. Other CITES-listed marine mammals also use this CRA.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that	Met	This area is a relatively undisturbed coastal region where the upwelling of nutrient-rich waters provides for highly productive and extremely diverse marine communities. The area possesses some of the best kelp bed habitat south of Santa Barbara and is recognized

Criterion		Status	Justification
	are either unique or are restricted in distribution.		as ESHA by NOAA and ~~CDFG~~CDFW. The Malibu coastline section from the Ventura-Los Angeles County line boundary, southeast to Latigo Point is recognized as one of the principal natural areas in the (coastal) State Water Quality Protection Area Program. It is area ASBS-24 (Area of Special Biological Significance). The CRA has critical habitat for the southern steelhead, tidewater goby, and the western snowy plover.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	This relatively undisturbed coastal region possesses some of the best kelp bed habitat south of Santa Barbara and supports the only remaining natural kelp beds off the mainland coast of the County. The kelp beds are recognized as ESHA by NOAA, ~~CDFG~~CDFW, and the Malibu Local Coastal Program. It has critical habitat for the southern steelhead, tidewater goby, and the western snowy plover
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	This area protects the entry point of two of three of the (endangered) southern steelhead spawning streams in the County and provides connective area for the endangered tidewater goby, which breeds in the brackish-water areas of the streams of the Santa Monica Mountains. Kelpbeds are the macroforest of the ocean, and the habitat and breeding and/or spawning ground for many marine animals. The sandy beaches provide feeding areas for many bird species, and the soft substrate offers a repository for eggs and nursery grounds for many species. The migration of marine species occur in this area for the California gray whale and for innumerable marine species whose plankton ride the ocean currents.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	As the main kelp bed of the County, this area is of great interest to marine scientists. It is also an edge kelp forest, separated by the long stretch of beaches of the Santa Monica Bay from the kelp beds of the Palos Verdes Peninsular area.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	This shoreline remains in essentially a native state as a remnant of what once was typical of rock and adjacent sand shoreline in Southern California. The coastline possesses the only complete, undisturbed sandy beaches remaining in the County. An important microcommunity of decomposers is present. Artificial modifications have been limited to small local areas. West of Point Dume, there is minor pollution; east of Point Dume, there is minor to moderate pollution, and kelp does not grow below 35 feet.

In conclusion, the area is a CRA because it contains: A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County, or regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) biotic resources that are of scientific

interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Palos Verdes Peninsula and Coastline CRA

For a description of the resources in the Palos Verdes Peninsula and Coastline CRA, please refer tothe description for the Palos Verdes Peninsula and CoastlineSEA above.

Point Dume CRA

Location

General

The Point Dume Coastal Resource Area (CRA) is located on the Malibu coastline and forms the northern end of Santa Monica Bay. Zuma Beach lies to the immediate northwest. Paradise Cove is just east. The CRA is important as a headland on the Pacific Flyway, for its nearby marine and its terrestrial habitats, and for critical habitat of the western snowy plover.

The CRA is located in the Point Dume United States Geological Survey (USGS) 7.5' California Quadrangle.

General Boundary and Resources Description

This headland extends into Santa Monica Bay more than a mile beyond the rest of the Malibu coast, and it is located within the Pacific Flyway. The CRA consists of the rocky coastal headland edge and six fingers extending into the interior canyons on the headland. Point Dume is a significant headland used during migration times on the Pacific Flyway. Point Dume is the southernmost habitat for coastal cliff flora such as the giant coreopsis (*Leptosyne gigantea*) and sea-lettuce (*Dudleya caespitosa)*. The CRA is contiguous with the Malibu Coastline CRA, which has notable tidepools with rich marine habitat on the eastern side of Point Dume. Southern California is known for its extensive sandy beaches, so Point Dume, which is one of very few places with rocky intertidal habitat between Palos Verdes Peninsula and the middle coastline of Ventura County, is a rare habitat in the County. The limited public access, the coastal strand vegetation, and the canyon slopes covered by Venturan coastal sage scrub, protect the resource values of this headland, both terrestrial and marine. The terrestrial and marine habitats combined make Point Dume an exceptional and unique CRA. The Marine Life Protection Act designated protected area in Malibu to be the Point Dume State Marine Conservation Area (SMCA) between El Matador State Beach west of Point Dume to the west side of Point Dume (east end of Zuma Beach), approximately a three-mile coastline. In the Conservation area, take is limited to certain designated fish and squid species for a distance of three nautical miles proceeding due north-south out from the shore. Adjacent, from the west side of Point Dume to the east side of Point Dume at Paradise Cove is designated as the Point Dume State Marine Reserve (SMR), with no take extending to three nautical miles offshore. This includes very fine tidepools on the east side.

Point Dume is one of two remaining areas in the County where a diverse and healthy mixture of terrestrial and marine habitats can be found in close association. Point Dume incorporates the

terrestrial habitats: the interior canyons, the unprotected rocky shore with numerous small caves, and the sandy beach pockets; and the Malibu Coastline CRA has the marine habitats that are adjacent: outlying reefs, rocks, kelp beds, and tide pools. The tide pools off of Point Dume are some of the very best remaining in the County. Due to strong upwelling along the coast bringing in nutrient-rich waters, the nearby marine habitat is characterized by highly diverse and productive marine communities. This relative healthiness of both the terrestrial and marine habitats is largely due to limited public access, which has protected the fragile marine and shoreline ecosystems.

Coastal strand vegetation is found on sandy beaches below bluffs that rise 100 to 200 feet above the coast. Giant coreopsis (*Leptosyne gigantea)* and sea-lettuce (*Dudleya caespitosa*) are found in these communities at the southern limit of their range. Several small drainages cut through the bluffs and extend over a mile inland. The slopes are covered by Venturan coastal sage scrub. The value of these communities is increased by the unique geographic position of Point Dume. The area is an important resting and jumping-off point for migratory birds. Without the remaining terrestrial habitats, this refuge would be lost.

The CRA will have critical habitat for the federally-threatened western snowy plover (*Charadrius alexandrinus nivosus*). Currently this critical habitat goes eastward from Trancas Beach, along Zuma Beach, and extends to the northwest sandy area along Point Dume. The plovers use the west sandy habitat of the Point Dume headland, and the critical habitat will eventually extend along the entire west side of the headland into the CRA. (The western snowy plover will also have critical habitat on the seaside of the barrier berm of the Malibu Lagoon.) The snowy plover has over 300 individuals using the beaches of the County for winter roosts, and there is potential for some to over-summer and breed in the County after a hiatus of many decades (Ryan Ecological Consulting, 2010).

Vegetation

Vegetation within the CRA is comprised of several community types. Coastal strand vegetation occurs along the immediate shore and on the cliffs and bluffs, overlooking the ocean coastal dune, and bluff scrub also can be found. In the ravines and upper slopes examples of Venturan coastal sage scrub intergrade with maritime succulent scrub. This is a type of coastal sage scrub, defined by the unusual giant coreopsis, which is found in some of the less disturbed areas of the CRA. Sensitive plant species and plant communities occurring or potentially occurring within the CRA are discussed in the Sensitive Biological Resources section.

Coastal Strand Vegetation:A community that occurs in the loose sand just above the high-tide line of the coast. This community is characterized by low species diversity because few plants can tolerate the harsh conditions on this dry, sandy, saline soil of high winds, salt spray and high summer temperatures.

Corresponding MCV communities:

- *Abronia latifolia – Ambrosia* spp. (dune mat) Herbaceous Alliance
- *Cakile (edentula, maritima)* (sea rocket stands) Semi-Natural Provisional Herbaceous Alliance

Coastal Bluff and Dune Scrub: Found on the cliffs and bluffs overlooking the ocean. This community formerly was found in many places along the coast, but is now restricted to a few locations. The

system consists of fine, sandy soil that dries rapidly. Plants typical of the dune scrub include dune buckwheat, rattle-pod, bladderpod, deer weed, sawtooth goldenbush, and California sunflower.

Corresponding MCV communities:

- *Baccharis pilularis* (coyote brush scrub) Shrubland Alliance
- *Lupinus arboreus* (yellow bush lupine scrub) Shrubland Alliance and Semi-Natural Shrubland Stands
- *Lupinus chamissonis-Ericameria ericoides* (silver dune lupine–mock heather scrub) Shrubland Alliance

Venturan Coastal Sage Scrub:Characterized by the summer drought-deciduous vegetation found near the Southern California coast south of Ventura. It has low, mostly soft-woody shrubs with bare ground underneath and between shrubs. This community is dominated by California sagebrush, California buckwheat, black sage, purple sage, and California encelia.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Artemisia californica-Salvia mellifera* (California sagebrush-black sage scrub) Shrubland Alliance
- *Artemisia californica-Eriogonum fasciculatum* (California sagebrush-California buckwheat scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Salvia apiana* (white sage scrub)Shrubland Alliance
- *Salvia leucophylla* (purple sage scrub) Shrubland Alliance
- *Salvia mellifera* (black sage scrub) Shrubland Alliance
- *Eriogonum fasciculatum* (California buckwheat scrub) Shrubland Alliance
- *Hazardia squarrosa* (sawtooth goldenbush scrub) Shrubland Alliance
- *Lotus scoparius* ([*Acmispon glaber*] deerweed scrub) Shrubland Alliance
- *Lupinus albifrons* (silver-bush lupine scrub) Shrubland Alliance
- *Malacothamnus fasciculatus* (bush mallow scrub) Shrubland Alliance

Maritime Succulent Scrub:A form of coastal sage scrub with many members of that community, as well as one or more endemic succulent evergreen species. Examples of this can be found throughout the CRA.

Corresponding MCV communities:

- *Leptosyne gigantea* (giant coreopsis scrub) Shrubland Alliance
- *Opuntia littoralis* (coast prickly-pear scrub) Shrubland Alliance
- *Lycium californicum* (desert thorn scrub) Provisional Shrubland Alliance

Marine Resources

The Malibu coastline is a relatively undisturbed coastal region where upwelling of nutrient-rich waters and a variety of habitats support highly productive and extremely diverse marine communities. The terrestrial habitat (here the Point Dume headland) and the marine habitats are integrally tied to one another. Disruption in one will impact the other. The marine habitats feed the seabirds that use the headland, and marine organisms, such as the grunion (fish, *Leuresthes tenuis)* use the sandy shore for spawning. The headland protects the nearshore habitats and controls and filters runoff so that the offshore habitats remain clean and have the terrestrial input of nutrients for which they are adapted. The nearby areas in the Malibu Coastline CRA possesses some of the best kelp bed habitat south of Santa Barbara, and the only remaining natural kelp beds on the mainland coast of the County. Rocky outcrops alternate with sandy stretches along this coastline and are found to a depth of 600 feet. The Point Dume headland typifies the alternating sand and rock on several scales. The Malibu coastline possesses the only complete, undisturbed sandy beaches remaining in the County. The west side of the headland has critical habitat for the snowy plover.

Intertidal Zone Habitats:Consist of a variety of coastal habitats that are periodically covered and uncovered by waves and tides. The rocky shores support a rich assortment of plants and animals including green, brown, and red algae. A wide variety of sessile invertebrates compete for space with the plants in this habitat. Mobile invertebrates, such as crabs and snails, can be found in great abundance. Fishes are chiefly limited to tidepools during high tide. (Grunion spawn on the high-tide areas of the sandy beach.) There is a community of small and microscopic organisms adapted to the interstices of the sand grains of the beach. Shorebirds actively forage in both rocky and sand areas during low tide. The rocky tidepools adjacent to the CRA on its east side are some of the finest remaining in the County. They are in the Malibu Coastline CRA and the Point Dume State Marine Reserve—no take of any kind is permitted.

Nearshore Subtidal Habitat: The Malibu Coastline CRA has many interactions with the biota of the CRA. Marine habitats include the rocky substrate of the lower level of the intertidal zone on the east side of Point Dume, to subtidal rocky areas that support a great diversity of invertebrates and fishes. Near the CRA this habitat is frequently dominated by giant kelp. The sandy offshore habitat on the west side of Point Dume has a wonderful variety of sand-adapted organisms, ranging from fishes to seastars, to many kinds of jellyfish, mollusks, and other invertebrates.

Kelp Forest Habitat: Giant kelp beds are located down to a depth of approximately 99 feet in the ocean surrounding Point Dume in the Malibu Coastline CRA. The kelp beds are part of one of the temperate zone's most productive habitats, by providing food, attachment sites and shelter for invertebrates and fishes. It is a supremely important nursery and recruitment habitat for juvenile fishes and invertebrates, and an important feeding area for seabirds that use Point Dume for roosting.

Wildlife

The wildlife found in the CRA is dependent upon the two basic regimes found there: marine and terrestrial. The shoreline and bluffs overlooking the coastal sections are home to or visited by a wide variety of shorebirds, migrating birds and marine life. The interior grasslands and ravines have a very different assemblage than other nearby coastal areas. The CRA ravines are separate and isolated from one another. They exhibit a reduced number of animal species than otherwise might be expected and probably suffer from the effects of fragmentation of a larger, more contiguous ecosystem.

Point Dume is a peninsula that projects its rocky cliff sides out into the Pacific Ocean relative to low bluffs and beaches to the east and west that are heavily impacted by human activity. Point Dume offers a variety of undisturbed habitats for marine and shorebirds. These cliffs and offshore rocks offer ideal roosting and feeding sites for numerous shorebirds, gulls, and other seabirds.

All wildlife species previously recorded, as well as those expected to occur, within the CRA are indicated in the *Comprehensive Floral & Faunal Compendium* of the *Los Angeles County SEA Update Study 2000 Background Report*. Sensitive wildlife species occurring or potentially occurring within the CRA are discussed in the Sensitive Biological Resources section.

Wildlife Movement

The CRA is on the Pacific Flyway migration route used by many birds seasonally. It plays an important role as a stopover because of its extensive undisturbed marine resources. Point Dume does not fall within any identified terrestrial movement routes for wildlife because it is isolated by the ocean on one side, and miles of developed land on the remaining sides.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare. This is due to the species' declining or limited population sizes, which usually results from habitat loss. Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS). The following sections indicate the habitats as well as plant and animal species present, or potentially present within the CRA, which have been accorded special recognition. When species are federally-listed as endangered or threatened, they often have federally-designated, geographically-specific "critical habitat areas." Critical habitat areas, after extensive study by experts, are judged to be essential to conservation and maintenance of the species. The CRA has proposed critical habitat for the federally-threatened western snowy plover.

Sensitive Plan Communities and Habitats

The CRA supports several habitat types considered sensitive by resource agencies. These are inventoried by California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW) in the California Natural Diversity Database (CNDDB) [2011]. The CNDDB includes state and federally-listed endangered, threatened, and rare vascular plants, as well as several sensitive vertebrate species. These communities include coastal sage chaparral scrub and maritime succulent scrub,

which occur throughout the CRA. These communities, or closely related designations, are considered high priority communities by the ~~CDFG~~CDFW, which indicates that they are experiencing a decline throughout their range. The array and composition of these communities has been discussed in the Vegetation section.

Sensitive Plant Species

The following special-status plant taxa have been reported or have the potential to occur within the CRA, based on known habitat requirements and geographic range information:

- Malibu baccharis (*Baccharis malibuensis*)RPR 1B.2
- Coulter's saltbush (*Atriplex coulteri*) RPR 1B.2
- Slender mariposa lily (*Calochortus clavatus* var*. gracilis*)RPR 1B.1
- Plummer's mariposa lily (*Calochortus plummerae*)RPR 1B.2
- Parry's spineflower (*Chorizanthe parryi* var*. parryi*)RPR 1B.1
- Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)RPR 1B.1
- Agoura Hills dudleya (*Dudleya cymosa* ssp*. agourensis*)FT, CSC, RPR 1B.2
- Marcescent dudleya (*Dudleya cymosa* ssp*. marcescens*)FT, SR, RPR 1B.2
- Lyon's pentachaeta (*Pentachaeta lyonii*)FE, SE, RPR 1B.1
- Sonoran maiden fern (*Thelypteris puberula* var*. sonorensis*)RPR 2.2

Sensitive Animal Species

The following special-status animal species are reported or are likely to be present within the CRA based on habitat requirements and known range attributes:

- Coast horned lizard (*Phrynosoma blainvillii*)CSC
- Two-striped garter snake (*Thamnophis hammondii*)CSC
- Western snowy plover (*Charadrius alexandrinus nivosus*)FT, CSC

Regional Biological Value

The CRA meets all SEA designation criteria and supports many regional biological values. Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE POINT DUME CRA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	This CRA includes habitat that is used by the western snowy plover (*Charadrius alexandrinus nivosus).* The west side of the headland includes federally-designated critical habitat that will expand into the CRA.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The CRA has coastal bluff vegetation on 100-200 feet cliffs, and on the sandy beaches below, is good coastal strand vegetation and habitat. The southern limit of the range for two plants characteristic of the bluffs to the north, giant coreopsis and sea-lettuce is on Point Dume. On the east side of Point Dume, the Malibu Coastline CRA has an excellent rocky intertidal area, which is a habitat that is no longer common in Southern California.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	Point Dume is one of the two remaining areas in the County where a diverse and healthy mixture of terrestrial Venturan coastal sage scrub and coastal strand vegetation are in close association with marine habitats. Its marine habitats consist of an unprotected rocky shore, with sandy beach pockets, and numerous small caves. The contiguous Malibu Coastline CRA hasoutlying reefs, rocks, and kelp beds. Due to strong upwelling along the coast, the waters are nutrient–rich and foster highly diverse and productive marine communities, which are protected somewhat by limited public access on the Point Dume headland.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The headland of Point Dume extends into Santa Monica Bay more than a mile beyond the rest of the Malibu coast, and it is located within the Pacific Flyway. As a result, the area is an important jumping off point for migratory birds. Without the remaining terrestrial habitats, this refuge would be lost.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The close association of native terrestrial vegetation and diverse marine habitats enriched by the nutrient upwelling make the Point Dume area scientifically important for the County. The southern-most point for giant coreopsis and sea lettuce are extreme points for vegetation that are more common to the north.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Relative to other coastal areas, the terrestrial vegetation communities at Point Dume are in good condition, in spite of some degradation from increased runoff and human usage. The marine flora and fauna are in excellent condition, and the association is important to conservation of the County's biodiversity.

In conclusion, the area is a CRA because it contains: A) core habitat of the western snowy plover, a

federally-threatened species, B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are restricted in distribution in the County and also regionally restricted; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Santa Catalina Island CRA

For a description of the resources in the Santa Catalina Islands CRA, please refer to the description of Santa Catalina Island in Section Vbelow.

Santa Monica Mountains CRA

For a description of the resources in the Santa Monica Mountains CRA, please refer to the description for the Santa Monica Mountains SEA above.

Terminal Island (Pier 400) CRA

Location

General

The Terminal Island (Pier 400) Coastal Resource Area (CRA) is located in the southernmost part of the County within the Port of Los Angeles. Terminal Island (Pier 400) supports one of the few remaining areas for breeding utilized by the endangered least terns. The CRA is an artificial dredge spoil island located generally in San Pedro Bay within the Port of Los Angeles. Pier 400 is in the outer harbor area, and the least tern nesting area is on the southern end. It is protected from future development per inter-agency agreement among the Port of Los Angeles, U.S. Fish and Wildlife Service, California Department of ~~Fish and Game~~Fish and Wildlife, and the U.S. Army Corps of Engineers. The area was specifically designed for least tern nesting and is maintained with buffer from the surrounding Port development, close range to foraging areas, and clearing of the flat sandy area to have little vegetation. During the nesting season (April-August) the site is designated as a no-trespassing area. When least terns nest outside the designated boundaries, a buffer is established for the nest(s) until the chicks are fledged. At other times, the Port may use the site for temporary purposes as long as it is restored prior to the following nesting season. The CRA corresponds directly to the California Audubon-designated Globally Important Bird Area (IBA), Pier 400 Tern Colony IBA.

The site is located in the Long Beach and San Pedro Quadrangles of the United States Geological Survey (USGS) 7.5 Minute Map Series (USGS, 1964).

General Boundary and Resources Description

The CRA is not on a natural island. It is an approximately 15-acre fenced area on the south end of Pier 400, part of Terminal Island, in the Los Angeles Harbor. The area is maintained, prepared, and monitored annually by the Port of Los Angeles for the least tern. The nesting site was created, along with the entire Pier 400 peninsula, of material dredged from the Los Angeles Harbor from 1995-2003. The substrate consists of sand with small rocks and many shell pieces. Non-native flora

colonize the area every year. Every year before the breeding period, the Port of Los Angeles has the plants surveyed and then cleared to prepare the terrain for what least terns prefer—a flat sandy area that is virtually free of vegetation that the terns can scrape to provide a shallow depression for their eggs. The northern part of Pier 400 is now a shipping container terminal. There is an undeveloped area, covered with low, volunteer vegetation, west of the CRA that may someday be used by the Port. The CRA site has been used by the least tern for nesting since it was created in 1997. TheCRA and the adjacent field on the west are separated and protected from Port activity by a chainlink fence with locked gate. In addition, the CRA has a peripheral chick fence to keep the chicks from wandering off the CRA area.

Vegetation

The vegetation in this CRA was removed in 2003 and 2004 to allow additional nesting area for the least tern. The common species seen include sea rocket (*Cakile maritima*), tree tobacco (*Nicotiana glauca*), Bermuda grass (*Cynodon dactylon*), puncture vine (*Tribulus terrestris*), and sow thistle (*Sonchus oleraceus*). This removal was judged a success, and clearing has been continued in recent years. Sensitive plant communities have not been found on the site.

Wildlife

Wildlife diversity and abundance within the CRA is limited by its remote location, only accessible by terrestrial animals after traversing long distances through industrial facilities and the narrow, paved causeway of access. Feral cats, rats and mice, and birds associated with development in the region, such as gulls, crows, rock doves, house finches, house sparrows and mockingbirds have been recorded in the area. Native herons that could prey upon the least tern chicks have been observed in the area. The site was also used for breeding in 2011 by two other species that prefer bare, scraped areas: black skimmers (*Rynchops niger*) and Caspian terns (*Hydroprogne caspia*). Many types of shore birds are found nearby.

Wildlife Movement

The site is a low quality habitat for terrestrial animal foraging, and it does not lie within any identified terrestrial movement routes for wildlife. However, it is well located as a linkage site for migratory waterfowl and some birds, specifically the least tern. Surrounding bay waters on three sides provide suitable area for the least tern foraging. The principle prey items they seek are small, schooling fish that frequent the surface area of bay and estuarine waters.

Sensitive Biological Resources

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, and/or rare. This is due to the species' declining or limited population sizes, which usually results from habitat loss. Watch lists of such resources are maintained by the California Department of ~~Fish and Game~~Fish and Wildlife (~~CDFG~~CDFW), the United States Fish and Wildlife Service (USFWS), and special groups, such as the California Native Plant Society (CNPS). The following sections indicate the habitats as well as plant and animal species present, or potentially present within the CRA, which have been accorded special recognition.

The site of this CRA is entirely artificial, but it provides the least terns the ideal kind of substrate they

prefer: a flat sandy area, devoid of vegetation, that they can scrape for a nesting depression. Artificially created sites (inadvertently created by development) are frequently chosen for breeding by least terns. The site has been used by the least tern for nesting since it was created in 1997 and has been continually managed for this use.

Sensitive Plan Communities and Habitats

TheCRA supports no habitat types considered sensitive by resource agencies, namely the ~~CDFG~~CDFW California Natural Diversity Data Base (CNDDB) [2011].

Sensitive Plant Species

No sensitive plants are expected to occur within this CRA.

Sensitive Animal Species

The California least tern (*Sternula antillarum browni*) is both state and federally-endangered. It nests in the CRA and forages in shallow water near the nest site. The western snowy plover (*Charadrius alexandrus nivosus*) is listed as a federally-threatened species and California species of concern, and migrants have been seen but have not nested. Black skimmers ([F-BCC, CA-SSC]) used the site for nesting in the 2011 season.

Regional Biological Value

The CRA meets several SEA designation criteria and supports many regional biological values. Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE TERMINAL ISLAND (PIER 400) CRA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	This area was set aside because endangered least terns use it for breeding in the summer. Their breeding depends on availability of forage fish, and they may not use the area consistently. In addition there may be some breeding by the black skimmer (bird of concern for the State and USFWS).
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	This area was set aside because endangered least terns use it for breeding in the summer. Their breeding depends on availability of forage fish, and they may not use the area consistently. In addition there may be some breeding by the black skimmer (bird of concern for the State and USFWS).
C)	Within the County, biotic communities, vegetative associations, and habitat of	Met	The least tern typically breeds in flat sandy areas that are created by disturbance, but are free of disturbance and vegetation during the breeding period. The area needs to be close to a source of the terns'

Criterion		Status	Justification
	plant or animal species that are either unique or are restricted in distribution.		prey, which are small, estuarine or surface-schooling marine fishes. The choice breeding areas require no disturbance because the terns make an unsheltered scoop for a nest, and eggs and nestlings would be crushed by constant traffic of vehicles or pedestrians. This kind of habitat was once common along the beaches of Southern California, but has nearly disappeared as estuaries have been filled and channelized, and sandy beaches have become a favorite Southern California recreation area.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	Los Angeles has many fine beaches that are potential nesting sites, but nearly all have become recreation areas. The terns have continued to use the areas with protection from disturbance, which are a small number compared to the previously available undisturbed sites.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The Terminal Island site is named as a CRA for the summer bird breeding that occurs.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Not Met	Due to the artificial construct of the area, the CRA does not serve as a relatively undisturbed example of the original natural biotic communities in the County.

In conclusion, the area is a CRA because it contains: A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; and E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.

CRA DESCRIPTION SOURCES

Alamitos Bay CRA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012) *The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.* Second Edition. Jepson Herbarium, Berkeley, CA. 1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals (898 taxa).* 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants, Bryophytes, and Lichens List.* Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

County of Los Angeles, Department of Regional Planning. 2006. *The Alamitos Bay SEA Description,* Los Angeles County, California.

Fish and Wildlife Services. 2000. *Federal Register*. "Endangered and Threatened Wildlife and Plants; Proposed Determination of Critical Habitat for the Coastal California Gnatcatcher; Proposed Rule". Fish and Wildlife Services; 32 pp.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

LSA Associates, Inc. October 2009. *Draft Environmental Impact Report: Alamitos Bay Marina Rehabilitation Project*, Prepared for the City of Long Beach.

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation, Second Edition* Sacramento: California Native Plant Society Press.

U.S. Fish and Wildlife Service. 1997. *Vernal Pools of Southern California Draft Recovery Plan*. U.S. Fish and Wildlife Service, Portland, Oregon. 113+pp.

Zedler, P.H. 1987. *The Ecology of Southern California Vernal Pools: A Community Profile*. U.S. Fish and Wildlife Service Biological. Report 85(7.11). 136 pp.

Ballona Wetlands CRA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012) *The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.* Second Edition. Jepson Herbarium, Berkeley, CA. 1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals* (898 taxa). 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants*, *Bryophytes*, *and Lichens List.* Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

County of Los Angeles, Department of Regional Planning. 2006. *The Ballona Wetlands SEA Description*, Los Angeles County, California.

Fish and Wildlife Services. 2000. *Federal Register*. "Endangered and Threatened Wildlife and

Plants; Proposed Determination of Critical Habitat for the Coastal California Gnatcatcher; Proposed Rule". Fish and Wildlife Services; 32 pp.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Philip Williams & Associates, Ltd. 2006. *Ballona Wetland Existing Conditions DRAFT Report*, *Section 5. Biological Resources.* Prepared for California State Coastal Conservancy.

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation*, *Second Edition* Sacramento: California Native Plant Society Press.

U.S. Fish and Wildlife Service. 1997. *Vernal Pools of Southern California Draft Recovery Plan*. U.S. Fish and Wildlife Service, Portland, Oregon. 113+pp.

Zedler, P.H. 1987. *The Ecology of Southern California Vernal Pools: A Community Profile*. U.S. Fish and Wildlife Service Biological. Report 85(7.11). 136 pp.

El Segundo Dunes CRA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012) *The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded.* Second Edition. Jepson Herbarium, Berkeley, CA. 1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals* (898 taxa). 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants*, *Bryophytes*, *and Lichens List.* Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

County of Los Angeles, Department of Regional Planning. 2006. *The El Segundo Dunes SEA Description*,Los Angeles County, California.

England & Nelson Environmental Consultants. 1976. *Land Capability/Suitability Study*, *Los Angeles County General Plan Revision Program*, *Significant Ecological Areas Report*,Riverside, California.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Sierra Delta Corporation. 1988. *Biota Report for Zond Systems*, *Inc.*, *Los Angeles Wind Electric Generating Station*, *Gorman*, *California*, *Conditional Use Permit 86453*,Las Vegas, Nevada.

Sapphos Environmental, Inc. January 2005. *Los Angeles/El Segundo Dunes Habitat Restoration Plan*. Prepared for Los Angeles World Airports and U.S. Department of Transportation, Federal Aviation Administration.

Sawyer, Keeler-Wolf and Evens. 2009. A Manual of California Vegetation, Second Edition

Sacramento: California Native Plant Society Press.

Malibu Coastline CRA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti (editors, 2012) *The Jepson Manual: Vascular Plants of California*, *Thoroughly Revised and Expanded*. Second Edition. Jepson Herbarium, Berkeley, CA. 1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals (898 taxa).* 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants, Bryophytes, and Lichens List.* Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

City of Malibu. 2009. Malibu General Plan*, Section II, Elements of the General Plan, Chapter 3.0 Conservation Element, 3.2 Existing Natural Resources.*

City of Malibu. 2007. *Draft Proposed Environmentally Sensitive Habitat Areas (ESHA) Findings for the City of Malibu LCP.*

County of Los Angeles, Department of Regional Planning. 1986. *Malibu Local Coastal Program Land Use Plan*. Los Angeles County, California.

County of Los Angeles, Department of Regional Planning. 2006. *The Malibu Coastline SEA Description,* Los Angeles County, California.

Fish and Wildlife Services. 2000. *Federal Register*. “Endangered and Threatened Wildlife and Plants; Proposed Determination of Critical Habitat for the Coastal California Gnatcatcher; Proposed Rule”. Fish and Wildlife Services; 32 pp.

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Ryan Ecological Consulting. 2010. The Western Snowy Plover in Los Angeles County, California. Report to California Department of ~~Fish and Game~~Fish and Wildlife. 136 pp.

http://losangelesaudubon.org/images/stories/pdf/westernsnowyploverin%20losangelescounty.pdf

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation, Second Edition* Sacramento: California Native Plant Society Press.

U.S. Fish and Wildlife Service. 1997. *Vernal Pools of Southern California Draft Recovery Plan*. U.S. Fish and Wildlife Service, Portland, Oregon. 113+pp.

Zedler, P.H. 1987. *The Ecology of Southern California Vernal Pools: A Community Profile*. U.S. Fish and Wildlife Service Biological. Report 85(7.11). 136 pp.

Point Dume CRA Sources

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, and Thomas J. Rosatti(editors, 2012)*The Jepson Manual: Vascular Plants of California*, *Thoroughly Revised and Expanded*. Second Edition. Jepson Herbarium, Berkeley, CA. 1600 pp., illus.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals (898 taxa).* 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants, Bryophytes, and Lichens List.* Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

City of Malibu. 2009. Malibu General Plan*, Section II, Elements of the General Plan, Chapter 3.0 Conservation Element, 3.2 Existing Natural Resources.*

Holland RF. *Preliminary descriptions of the terrestrial natural communities of California*. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Ryan Ecological Consulting. 2010. The Western Snowy Plover in Los Angeles County, California. Report to California Department of ~~Fish and Game~~Fish and Wildlife. 136 pp.

http://losangelesaudubon.org/images/stories/pdf/westernsnowyploverin%20losangelescounty.pdf

Sawyer, Keeler-Wolf and Evens. 2009. *A Manual of California Vegetation, Second Edition* Sacramento: California Native Plant Society Press.

U.S. Department of Commerce. National Oceanic and Atmospheric Administration. National Marine Sanctuary Program. 2008. *Channel Islands National Marine Sanctuary Management Plan/Final Environmental Impact Statement.* Silver Spring, MD

Terminal Island (Pier 400) CRA Sources

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *Special Animals (898 taxa).* 60 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. April 2011. *Special Vascular Plants, Bryophytes, and Lichens List.* Quarterly publication. 71 pp.

California Department of ~~Fish and Game~~Fish and Wildlife, Natural Diversity Database. January 2011. *State and Federally Listed Endangered and Threatened Animals of California.* 13 pp.

County of Los Angeles, Department of Regional Planning. 2006. *The Pier 400, Terminal Island SEA Description,* Los Angeles County, California.

Holland RF. Preliminary descriptions of the terrestrial natural communities of California. 1986 and 1992 Update. California Department of ~~Fish and Game~~Fish and Wildlife unpublished report.

Science Applications International Corporation. 2008. Draft Biological Assessment, Pacific L.A. Marine Terminal Crude Oil Terminal Project. Prepered for the U.S. Army Corps of Engineers, Los Angeles District and Port of Los Angeles, Harbor Department.

Sawyer, Keeler-Wolf and Evens. 2009. A Manual of California Vegetation, Second Edition Sacramento: California Native Plant Society Press.

V. Coastal Zone Resources

Coastal Zone Resources include natural resources in the the County's coastal areas, which are neither SEAs nor CRAs, and areas that contain SEAs or CRAs but are larger than one single SEA or CRA.

Ballona Wetlands

For a description of the resources in the Ballona Wetlands, please refer to the description for the Marina Del Rey below, and the description for the Ballona Wetlands Significant Ecological Area (SEA) in Section IV.

Marina Del Rey[4]

Marina Del Rey is a man-made feature that occupies part of the historical estuary near the mouth of Ballona Creek. Prior to the arrival of Europeans, the Ballona area was an ancient estuary of the Los Angeles River, with the mouth of the river entering the Pacific Ocean north of the Westchester Bluffs, forming a broad coastal plain with seasonal and permanent wetlands extending north and east toward higher ground in present-day Santa Monica[5]. A long range of natural sand dunes cut off the ocean from the majority of the low-lying ground, which featured a network of tidal channels and extensive salt marsh (i.e., the historical "Venice Marshes" or "Ballona Wetlands"). Until a flood in the early 1800s, the Los Angeles River emptied at Santa Monica Bay, along the current course of Ballona Creek.[6] The historical landscape along the coast west of present-day Lincoln Boulevard (i.e., an area encompassing all of Marina Del Rey) likely consisted of wide tidal channels and mudflats, salt marshes, coastal dunes, pockets of freshwater and/or brackish marsh, as well as riparian scrub. Also present was a coastal prairie community described by researchers as far back as the 1930s

[4]Adapted from Hamilton, RA and Cooper, DS, 2010. Conservation and Management Plan for Marina Del Rey, Los Angeles County, California. Prepared for the County Los Angeles Department of Beaches and Harbors and the Department of Regional Planning.

[5] Cooper, D. S. 2008. The use of historical data in the restoration of the avifauna of the Ballona Wetlands, Los Angeles County, California. Natural Areas Journal 28:83–90.

[6] Gumprecht B. 1999. The Los Angeles River: Its Life, Death, and Possible Rebirth. Johns Hopkins University Press, Baltimore, MD.

(e.g., “the meadow” referred to by von Bloeker 1943[7]). These are generally the habitat types typical of coastal estuaries throughout Southern California and northwestern Baja California, Mexico.[8] Comparable coastal estuaries on broad plains in Southern California include Carpinteria Marsh, Mugu Lagoon, AlamitosBay, Bolsa Chica, UpperNewportBay, and the Tijuana River Estuary.

By the mid-1900s, much of Ballona Creek had been excavated and routed through a channel, at first earthen (1920s), then concrete-lined (late 1930s), principally to control floods in the BallonaValley that regularly destroyed cropland and generally hindered development. The most serious and final impact to lower Ballona Creek and the majority of its natural wetlands came in the early 1960s, with the completion of Marina Del Rey, which eliminated nearly all the functional wetlands north of the Ballona Creek channel and left only a small remnant to the south, along Culver Boulevard. However, just as the creation of Marina Del Rey development entailed the elimination of certain natural habitats, it created novel ones, with the addition of hundreds of evergreen, semi-tropical, trees, as well as irrigated lawns and man-made structures.

Today the channel waters of Marina Del Rey and its breakwater are designated by California Audubon as a part of the Ballona Wetlands State Important Bird Area (IBA), recognizing the important natural resources that still occur in this district of the County. The IBA includes the Ballona Lagoon in nearby Venice, the Del Rey Lagoon across Ballona Creek in Playa Del Rey, the least tern nesting area on Venice City Beach, the Strand Beach south of the Ballona Channel opening, the Ballona Channel, the Ballona Wetlands both north and south of the Ballona Channel, and Bluff Creek that feeds the Ballona Freshwater Marsh. The IBA designation recognizes this as a unit, all the parts contributing to the welfare of the whole. As an example, the federally-endangered least terns that breed on VeniceCityBeach need to forage widely, in all parts of the IBA waters and beyond in order to successfully raise their young to fledglings.

Vegetation

Vegetation of the Marina Del Rey has not been formally described; however, the Conservation & Management Plan for Marina Del Rey, Los Angeles County, California (Hamilton and Cooper, 2010.) discusses six areas within Marina Del Rey with regard to their value as avian resource areas. Because no vegetation map has been prepared for the Marina, these areas are listed individually below, along with any corresponding natural or Semi-Natural vegetation types that are to be expected within each of the six areas.

Oxford Stormwater Retention Basin**:**Provides a flood-control function for the development and is lined with native and non-native species. The shoreline of the basin has been landscaped

[7]von Bloeker, J. C. 1943. The fauna and flora of the El Segundo sand dunes: Birds of El Segundo and Playa del Rey. Bulletin of the Southern California Academy of Sciences 42:1–30 (Part 1) and 90–103 (Part 2).

[8] Grewell, B. J., Callaway, J. C., and Ferren, W. R., Jr. 2007. Estuarine wetlands. Pp. 124–154 in Terrestrial Vegetation of California (M. G. Barbour, T. Keeler-Wolf, and A. A. Schoenherr, eds.). University of California Press, Berkeley. Pickart, A. J., and Barbour, M. G. 2007. Beach and dune. Pp. 155–179 in Terrestrial Vegetation of California (M. G. Barbour, T. Keeler-Wolf, and A. A. Schoenherr, eds.). University of California Press, Berkeley.

extensively with non-native trees and shrubs, especially small-flowered myoporum (*Myoporum laetum*). The myoporum landscaping currently in poor health, presumably due to an infestation of the myoporum thrip (*Klambothrips myopori*).

Corresponding MCV communities:

- *Schinus* (*molle*, *terebinthifolius*)-*Myoporum laetum* (Pepper tree or Myoporum groves) Semi-Natural Woodland Stands
- *Eucalyptus* (*globulus*, *camaldulensis*) (Eucalyptus groves) Semi-NaturalWoodland Stands

Ballona Lagoon: The northern extent of the former coastal lagoon at the mouth of the Ballona Wetlands, and now the southern extension of the "Grand Canal" in Venice (adjacent to and just west of Marina Del Rey), this site has been known as "Ballona Lagoon" since 1996 when extensive habitat restoration was completed in an effort to bring back a native coastal scrub community. The lagoon is tidal, and a band of mudflat is usually exposed around the entire lagoon, but only the upper/northern end drains completely except during the most extreme low tides. Saltmarsh vegetation forms a ring around the upper mudflat, below the coastal scrub.

Coresponding MCV communities

- *Schinus* (*molle*, *terebinthifolius*)-*Myoporum laetum* (pepper tree or myoporum groves) Semi-Natural Woodland Stands
- *Carpobrotus edulis* or other ice plants (ice plant mats) Semi-NaturalHerbaceous Stands
- *Sarcocornia pacifica* (*Salicornia depressa*) (pickleweed mats) Herbaceous Alliance
- Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*) new Alliance

Del Rey Lagoon: This area is entirely landscaped with lawn and ornamental non-native *Ficus* and *Acacia* trees.

Coresponding MCV communities: None at this time.

Ballona Wetlands: This, the main tidal marsh area remaining at Ballona, is located between the Ballona Creek channel and Culver Boulevard. It features extensive pickleweed (*Salicornia* spp.) marsh habitat, muddy tidal channels, and a large saltpan that is irregularly moistened by rain, dense fog, and high tides.

Coresponding MCV communities

- *Sarcocornia pacifica* (*Salicornia depressa*) (pickleweed mats) Herbaceous Alliance

Ballona Freshwater Marsh: This marsh, constructed in 2003 at the corner of Lincoln and Jefferson Boulevards, just south of Marina Del Rey, supports large expanses of tules, cattails, and other freshwater marsh vegetation.

Coresponding MCV communities

- *Schoenoplectus acutus* (hardstem bulrush marsh) Herbaceous Alliance
- *Schoenoplectus californicus* (California bulrush marsh) Herbaceous Alliance
- *Typha* (*angustifolia*, *domingensis*, *latifolia*) (cattail marshes) Herbaceous Alliance

Centinela Confluence: This refers to the tidally-influenced confluence of Ballona Creek at the Centinela Channel, just south of the State Route-90 bridge. A patch of tall, lush grasses serves as a consistent roosting and foraging location for herons, egrets, brown pelicans, gulls, terns, and shorebirds.

Corresonding MCV communities: None at this time.

Wildlife

As reviewed by Cooper[9], many bird species associated with freshwater marsh, coastal lagoon, and riparian habitats were lost from the Ballona area during the early period of development (pre-1930s); many saltmarsh species, including waterfowl and shorebirds that occurred in large flocks, suffered heavy losses during the middle period (1940s to 1960s); and since the 1960s, many open-country species, particularly those of agricultural fields and extensive grasslands, have either been extirpated or experienced serious declines.

Cooper (2006[10]) documented the ongoing colonization of the local area by bird species that require tall trees for breeding and/or foraging, and by species frequently associated with human habitation. This colonization phenomenon has intensified as the Marina's non-native landscaping has matured, providing much more structural complexity than was present formerly, but at the expense of numerous species that depend on natural, wild habitats for their persistence in the landscape or for refueling during long migrations. Currently, the area is used extensively by nesting and foraging great blue heron (*Ardea herodias*), great egret (*A. alba*), snowy egret (*Egretta thula*), black-crowned night heron (*Nycticorax nycticorax*), and double-crested cormorant (*Phalacrocorax auritus*).

A well-documented least tern colony (federally and state-listed Endangered) is present nearby at Venice Beach and is known to have suffered predation by crows and black-crowned night herons, both of which are dependent on non-native landscaping and artificial structures within and

[9] Cooper, D. S. 2008. The use of historical data in the restoration of the avifauna of the Ballona Wetlands, Los Angeles County, California. Natural Areas Journal 28:83–90.

[10] Cooper, D. S. 2006. Annotated checklist of extirpated, reestablished, and newly-colonized avian taxa of the Ballona Valley, Los Angeles County, California. Bulletin of the Southern California Academy of Sciences 105:91–112.

surrounding Marina Del Rey for nesting substrate.

Sensitive Biological Resources

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system. The initial category level of Rare Plant Rank (RPR) is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in Californiaand elsewhere), 2 (rare or endangered in Californiabut more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution). In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added: .1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur within the SEA, based on known habitat requirements and geographic range information:

- Southern tarplant (Centromadia parryi ssp. australis)RPR 1B.1
- Orcutt's pincushion (Chaenactis glabriuscula var. orcuttiana)RPR 1B.1
- Coastal goosefoot (Chenopodium littoreum)RPR 1B.2
- Coulter's goldfields (Lasthenia glabrata ssp. coulteri) RPR 1B.1
- Ballona cinquefoil (Potentilla multijuga)RPR 1A
- Estuary seablite (Suaeda esteroa)RPR 1B.2

The following special-status animal species are reported or are likely to be present within the SEA based on habitat requirements and known range attributes:

- Mimic tryonia (*Tryonia imitator*)~~CDFG~~CDFW Special Animals List
- Wandering skipper (*Panoquina errans*)~~CDFG~~CDFW Special Animals List
- Silvery legless lizard (*Anniella pulchra pulchra*)FSS, SSC
- Two-striped garter snake (*Thamnophis hammondii*)BLMS, FSS, SSC
- Tricolored blackbird (*Agelaius tricolor*)BCC, BLMS, SSC, USBC, AWL, ABC
- Western snowy plover (*Charadrius alexandrinus nivosus*)FT, BCC, SSC, ABC, AWL, USBC
- California black rail (*Laterallus jamaicensis coturniculus*)BCC, ST, ~~CDFG~~CDFW Fully Protected, USBC, AWL, ABC
- Belding's savannah sparrow (*Passerculus sandwichensis beldingi*)SE
- California least tern (*Sternula antillarum browni*)FE, SE, ~~CDFG~~CDFW Fully Protected, USBC, ABC

- South coast marsh vole (*Microtus californicus stephensi*)SSC
- Southern California saltmarsh shrew (*Sorex ornatus salicornicus*)SSC

San Clemente Island

San Clemente Island lies approximately63 miles south of the City of Long Beach and 78miles west of the City of San Diego. San Clemente Island is approximately 24miles long and 5miles across at its widest point. It has a land area of approximately 57 square miles. Since 1934, San Clemente Island has been owned and operated by the U.S. Navy. More than a dozen range and operational areas are clustered within a 60 mile radius of San Clemente Island. The Commander-in-Chief, Naval Forces, Pacific (CINCPACFLT) is the major claimant for San Clemente Island, and the Naval Air Station, North Island (NASNI) is responsible for its administration.

The climate of the Island is classified as semi-arid, which is similar to the Southern California coastal areas, except for more fog and overcast weather and cooler year-round temperatures. Aided by the Santa Ana winds, temperatures exceeding 90 degrees occasionally occur between August and October. Rainfall is slight and occurs mostly between the months of November and April (San Clemente Island Master Plan).

The Island is a very important biological resource for the County, California, and the U.S. Any island is a microcosm of evolutionary processes, and studies of island biota lead to many insights on biological community processes—how food webs are structured and how to maintain them in the context of impacts. The Island has 14 endemic plants (known only from the Island; 6 of which are federally-endangered) and 29 other plants known only from the Island and other Channel Islands (the northern ones and Santa Catalina Island). Some of the Island's endemics have their closest relatives on islands off of Baja California, which is over 500 miles away, and not the nearest neighboring islands. The plants had a major setback with about 400 years of goat and pig grazing, but the Navy has finally removed the last of these (a goat in 1992), and plants have responded vigorously to predation relief in most cases.

There is multiple federal recognition of the Island's resources. The Island has endemic birds, notably the federally-endangered shrike (*Lanius ludovicianus mearnsi*) and the federally-threatened San Clemente sage sparrow (*Amphispiza belli clementeae*). The shrike crashed to a population of 14 birds in 1998, but with a Navy recovery program of incubating eggs, the shrikes have rebounded to about 200 individuals. The chief predators were or are the introduced black rat and feral cats, but the goats did major indirect damage by undermining and browsing the trees that the shrike needs to breed. The Island has an endemic federally-threatened Island night lizard (*Xantusia riversiana*), and a subspecies of the island fox (*Urocyon littoralis clementae*) that is state-threatened and monitored by the Navy. Although it does not include offshore reefs, rocks, and pinnacles under the jurisdiction of the armed forces, the California Coastal National Monument, under the Bureau of Land Management in the U.S. Department of the Interior, manages the rocks within one nautical mile of the coast of the Island under this program.

State recognition has been equally strong. The Island has many state-recognized sensitive species. The Island is designated by the California State Water Resources Control Board as an ASBS (Area of Special Biological Significance), which is a marine area with exceptionally good water quality and natural community features. Populated and disturbed areas along the shore are zones of exception,

and there is one small designated area at the sewage outfall out of 100 natural gullies and ephemeral streams and 23 known Navy discharges. The Island is reputedly a favorite of snorkelers and divers for the marine life, and its waters are on the main migration path for the CITES Appendix I California gray whale (*Eschrichtius robustus*).

The Island and its nearshore out to about 0.8 mile offshore is designated by California Audubon as the San Clemente Island Globally Important Bird Area (IBA). Over 240 bird species regularly use the Island, and about 30 species inhabit the Island year-round.

The Island has unique features that are mysterious in some respects—phenomena waiting for discovery. The Island is nearly surrounded by sea cliffs, which in their steepness, provide the protection from predators (including introduced rats) that seabirds need for breeding. It is probable that some breeding by marine birds is unknown, since they often forage and return to feed their offspring at night, which is a difficult phenomenon to observe for predators and humans alike. Colonies are yet to be discovered. A known marine bird that has this breeding pattern is the federal candidate for listing, Xantus' murrelet (*Synthliboramphus hypoleucus*). Because it is so distant from shore, this Island has many oceanic influences that are unique for the Channel Islands—much more than the other nearby islands. For example, an oceanic bird, the red-tailed tropic bird (*Phaethon rubricauda*), once had some breeding on Pyramid Head before this area became part of the shore bombardment range. The Ashy storm-petrel (*Oceanodroma homochroa*), which is a state species of concern and one of the rarest storm-petrels, is known to breed in the Seal Cove area, and could also be breeding elsewhere on the Island.

Vegetation

Despite the Island's barren look, a large variety of plant life is present. The Island harbors 14 endemic plants and 29 insular endemic plants restricted to the Channel Island system (San Clemente Island Master Plan).

Domestic animals introduced to the Island, including cats, pigs, and goats, have greatly impacted the native plant communities. Beginning in 1875, the introduction of Spanish goats drastically altered the ecological structure of the Island due to constant foraging and grazing. Native plants and animals were significantly reduced, which resulted in an effort to remove the goats from the Island. By 1992, the U.S. Fish and Wildlife Service removed all goats and pigs from the Island (USFWS, California Channel Islands Species Recovery Plan).

Plant communities on the Island were classified using standard methodology and terminology. Most of the communities discussed correspond directly with those listed in Holland's Preliminary Descriptions of the Terrestrial Natural Communities of California(1986 and 1992 update). Other communities are named based on dominant species within them and/or commonly used terminology. Descriptions and general locations of each plant community on the Island, including maritime desert scrub, maritime sage scrub, island woodland, grassland, coastal salt marsh, and disturbed areas are given below.

In recent years, ecologists have refined previous vegetation classification approaches to define communities primarily by their constituent plant assemblages, and have now widely adopted the classification system described by Sawyer, Keeler-Wolf and Evens in A Manual of California Vegetation, Second Edition 2009 (MCV). This has become the accepted standard recognized by the California Department of ~~Fish and Game~~Fish and Wildlife, the California Native Plant Society and

the U.S. Fish and Wildlife Service.

The important difference between current and earlier methods is that earlier classifications were based on a variety of factors, such as physiographic features, as in the case of vernal pools; or by specific plants, as in the case of coast live oak woodland; or by the use of commonly accepted terms, as in chaparral. In the MCV, plant communities are defined with more precision as botanical alliances where one, or occasionally two, plant species are dominant or co-dominant with a host of other possible associated plants. The MCV lists no one plant community called "chaparral" because in habitats of this type, any one of a variety of shrubs can be dominant and influence the character of the vegetation. For example, in a location where chamise (*Adenostoma fasciculatum*) is predominant, the alliance is classified as an *Adenostoma fasciculatum* Shrubland Alliance, while close by, greenbark ceanothus (*Ceanothus spinosus*) may emerge as the most common shrub and this is termed a *Ceanothus spinosus* Shrubland Alliance.

The transition to the new MCV format is ongoing. Not all alliances have been fully described and new ones are still being recognized. As such, a significant amount of field work and site surveying for accuracy would be needed to verify all existing alliances on the Island, as well as extensive research to define every alliance in the new MCV plant communities' format. The more familiar nomenclatures will continue to be used for the Island when appropriate.

An effort has been made to conform to this new format. Descriptions and general locations of each plant community as described in the California Channel Islands Species Recovery Plan (USFWS, 1984) appear below. The plant communities correspond to the classifications used in that document. Each was considered baseline information and evaluated for the potential presence of alliances as described in the MCV. Alliances with matching profiles of the given criteria are listed. In many cases, only with further investigation can the presence of some alliances be confirmed. In addition, it should be noted that not all alliances are listed within this description as many alliances have yet to be defined and new alliances are still being discovered. Descriptions and general locations of the each plant community present on the Island are given below.

Maritime Desert Scrub - (Lycium Phase, Typical Phase, and Cholla Phase): Includes a mixture of low growing, dry-season deciduous scrubs and cactus located along the southern and western shores. The predominant deciduous shrubs include California desert-thorn (*Lycium californicum*) and island senecio (*Senecio lyonii*), while California brittle-bush (*Encelia californica*) and California sagebrush (*Artemisia californica*) are the predominant maritime sage scrub species. Coastal prickly-pear (*Opuntia littoralis*) also exists in abundance. The south-facing slopes at the southern end of the island are dominated by coastal cholla (*Cylindropuntia prolifera*), but box thorn and cunyado (*Bergerocactus emoryi*) also exist.

Corresponding MCV communities:

- *Lycium californicum* (California desert-thorn) Shrubland Provisional Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Opuntia littoralis* (coast prickly pear scrub) Shrubland Alliance

Maritime Sage Scrub:Located on steep eastern slopes and in some canyons on the west side of the Island. Lemonadeberry (*Rhus integrifolia*)can be found on both sides of the Island on relatively level ground. Many types of chaparral shrubs are present, including chamise, island ceanothus (*Ceanothus megacarpus* var. *insularis*), Catalina crossosoma (*Crossosoma californicum*), Channel Island tree poppy (*Dendromecon harfordii*), toyon (*Heteromeles arbutifolia*), laurel sumac (*Malosma laurina*), Catalina cherry (*Prunus ilicifolia* ssp. *lyonii*), island redberry (*Rhamnus pirifolia*), blue elderberry (*Sambucus nigra* var. *caerulea*), and poison oak (*Toxicodendrom diversilobum*).

Corresponding MCV communities:

- *Rhus integrifolia* (lemonade berry scrub) Shrubland Alliance
- *Ceanothus megacarpus* (big pod ceanothus chaparral) Shrubland Alliance
- *Malosma laurina* (laurel sumac scrub) Shrubland Alliance

Island Woodland: Located in the western and eastern canyons, is the only tree vegetation type present on the Island. It includes Catalina cherry, Santa Cruz Islandironwood (*Lyonothamnus floribundus* ssp. *aspleniifolius*), island oak (*Quercus tomentella*), blue elderberry, and toyon.

Corresponding MCV communities:

- *Prunus ilicifolia* (holly leaf cherry chaparral) Shrubland Alliance
- *Lyonothamnus floribundus* (Catalina ironwood groves) Woodland Special Stands
- *Quercus tomentella* (Island oak groves) Woodland Special Stands

Grasslands: Cover the central uplands of the Island. Although dominated by exotic annual herbs, scattered native wildflowers also exist. Native perennial needlegrass, larkspur, and brodiaea are also present.

Corresponding MCV communities:

- *Bromus (diandrus, hordeaceus)-Brachypodium distachyon* (annual brome grasslands) Semi-Natural Herbaceous Stands
- *Bromus rubens-Schismus* (arabicus, barbatus) (red brome or Mediterranean grass grasslands) Semi-Natural Herbaceous Stands
- *Lasthenia californica-Plantago erecta-Vulpia microstachys* (California goldfields-dwarf plantain-six-weeks fescue flower fields) Herbaceous Alliance
- *Nassella [Stipa] pulchra* (purple needle grass grassland) Herbaceous Alliance

Coastal Strand and Dunes: Coastal strand and dune vegetation is restricted to small areas along the south and northwest coasts of the Island. Predominantly associated with sandy substrates, several species typical of this vegetation type also occur in scattered rocky areas behind beaches. Introduced crystalline iceplant (*Mesembryanthemum crystallinum*) and grasses are abundant.

Corresponding MCV communities:

- *Carpobrotus edulis* or other ice plants (ice plant mats) Semi-Natural Herbaceous Stands
- *Abronia latifolia - Ambrosia chamissonis* (dune mat) Herbaceous Alliance

Coastal Salt Marsh: Exist on the south side of the Island. These areas are proximate to the impact zone of the shore bombardment range, and therefore, the biological information is somewhat limited. However, pickleweed (*Salicornia pacifica*), alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), and California sea-blite (*Suaeda californica*)are known to exist.

Corresponding MCV communities:

- Sarcocornia [Salicornia] pacifica(Salicornia depressa)(pickleweed mats)Herbaceous Alliance
- Frankenia salina(alkali heath marsh)Herbaceous Alliance
- Distichlis spicata(salt grass flats)Herbaceous Alliance

Disturbed Areas: Mainly consist of plants that are native to the Old World. Once limited to ruderal areas, these areas have expanded and exotic species are now common throughout the Island.

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*)(wild oats grasslands)Semi-NaturalHerbaceous Stands
- *Brassica nigra* and other mustards (upland mustards)Semi-NaturalHerbaceous Stands
- *Bromus* (*diandrus*, *hordeaceus*)-*Brachypodium distachyon* (annual brome grasslands)Semi-NaturalHerbaceous Stands
- *Bromus rubens-Schismus* (*arabicus*, *barbatus*)(red brome or Mediterranean grass grasslands)Semi-NaturalHerbaceous Stands

(USFWS, California Channel Islands Species Recovery Plan)

Wildlife

An abundance of marine mammals thrive in waters surrounding the Island. The most prominent are the California sea lion (*Zalophus californianus*) and the harbor seal (*Phoca vitulina*); however, porpoises and whales are frequently sighted. The Island is in the path of a migration route, which along with great depths and caves, creates a rich and varied marine environment (San Clemente Island Master Plan).

The Island supports a unique assortment of terrestrial fauna. There are two lizard species on the Island: western side-blotched lizard (*Uta stansburiana elegans*) and the San Clemente Island night lizard (*Xantusia riversiana reticulata*). As many as 240 bird species inhabit the Island at various periods of the year. Around 30 species breed on the Island, while the other species are mainly migrants. Some of the bird species include island horned lark (*Eremophila alpestris insularis*),

western meadowlark (*Sturnella neglecta*), white-crowned sparrow (*Zonotrichia leucophrys*), American kestrel (*Falco sparverius*), Gambel's quail (*Callipepla gambelii*), and the exotic chukar (*Alectoris chukar*). Waterbirds are attracted to the rocky shore of the Island, which provides opportunities for foraging and resting. Some of the waterbirds on the Island include western gull (*Larus occidentalis*), Brandt's cormorant (*Phalacrocorax penicillatus*), California brown pelican (*Pelecanus occidentalis californicus*), royal tern (*Thalasseus maximus*), black oystercatcher (*Haematopus bachmani*), and Xantus' murrelet (*Synthliboramphus hypoleucus*)(USFWS, California Channel Islands Species Recovery Plan).

The Island is also home to the following bat species: California myotis (*Myotis californicus*), fringed myotis (*M. thysanodes*), Townsend's big-earned bat (*Corynorhinus townsendii*), and Mexican free-tailed bat (*Tadarida brasiliensis*). The San Clemente deer mouse (*Peromyscus maniculatus clementis*) is also native to the Island. One of the most notable mammals on the Island is the San Clemente Island fox (*Urocyon littoralis clementae*), which inhabits most of the Island(USFWS, California Channel Islands Species Recovery Plan).

Sensitive Biological Resources

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system. The initial category level of Rare Plant Rank (RPR) is indicated by the ranks 1A (presumed extinct in California), 1B (rare or endangered in Californiaand elsewhere), 2 (rare or endangered in Californiabut more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution). In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California), or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur on San Clemente Island, based on known habitat requirements and geographic range information:[11]

- Woven-spored lichen (*Texosporium sancti-jacobi*)~~CDFG~~CDFW Special Plants List, RPR 1B.2
- Red sand-verbena (*Abronia maritima*)RPR 4.2
- San Clemente Island bird's-foot trefoil (*Acmispon argophyllus* var. *adsurgens*)SE, RPR 1B.1
- San Clemente Island lotus (*Acmispon dendroideus* var. *traskiae*)FE, SE, RPR 1B.1

[11] Status abbreviations: ABC: American Bird Conservancy Green List; BLMS: Bureau of Land Management Sensitive Species; CDF: California Department of Forestry and Fire Protection Sensitive Species; CDFG: California Department of Fish and Game; FD: Federally delisted; FE: Federally listed as Endangered; FSS: USDA Forest Service Sensitive Species; FT: Federally listed as Threatened; RPR: Rare Plant Rank; SE: State-listed as Endangered; SD: State delisted; SSC: CDFG Species of Special Concern; WBWG: Western Bat Working Group: High, Medium or Low priority

- Aphanisma (*Aphanisma blitoides*)RPR 1B.1
- Island sagebrush (*Artemisia nesiotica*)RPR 4.3
- San Miguel Island milk-vetch (*Astragalus miguelensis*)RPR 4.3
- San Clemente Island milk-vetch (*Astragalus nevinii*)RPR 1B.2
- Coulter's saltbush (*Atriplex coulteri*)RPR 1B.2
- South Coast saltscale (*Atriplex pacifica*)RPR 1B.2
- Golden-spined cereus (*Bergerocactus emoryi*)RPR 2.2
- Island morning-glory (*Calystegia macrostegia* ssp. *amplissima*)RPR 4.3
- San Clemente Island evening-primrose (*Camissonia guadalupensis* ssp. *clementina*)RPR 1B.2
- San Clemente Island paintbrush (*Castilleja grisea*)FE, SE, RPR 1B.2
- Island ceanothus (*Ceanothus megacarpus* var. *insularis*)RPR 4.3
- Seaside cistanthe (*Cistanthe maritima*)RPR 4.2
- Nevin's woolly sunflower (*Constancea nevinii*)RPR 1B.3
- Small-flowered morning-glory (*Convolvulus simulans*)RPR 4.2
- Catalina crossosoma (*Crossosoma californicum*)RPR 1B.2
- Trask's cryptantha (*Cryptantha traskiae*)RPR 1B.1
- Island tarplant (*Deinandra clementina*)RPR 4.3
- San Clemente Island larkspur (*Delphinium variegatum* ssp. *kinkiense*)FE, SE, RPR 1B.1
- Thorne's royal larkspur (*Delphinium variegatum* ssp. *thornei*)RPR 1B.1
- South island bush-poppy (*Dendromecon harfordii* var. *rhamnoides*)RPR 1B.1
- Bright green dudleya (*Dudleya virens* ssp. *virens*)RPR 1B.2
- San Clemente Island buckwheat (*Eriogonum giganteum* var. *formosum*)RPR 1B.2
- Island buckwheat (*Eriogonum grande* var. *grande*)RPR 4.2
- Island poppy (*Eschscholzia ramosa*)RPR 4.3
- Cliff spurge (*Euphorbia misera*)RPR 2.2

- San Clemente Island bedstraw (*Galium catalinense* ssp. *acrispum*)SE, RPR 1B.2
- Showy island snapdragon (*Gambelia speciosa*)RPR 1B.2
- Nevin's gilia (*Gilia nevinii*)RPR 4.3
- San Clemente Island hazardia (*Hazardia cana*)RPR 1B.2
- Decumbent goldenbush (*Isocoma menziesii* var. *decumbens*)RPR 1B.2
- Island jepsonia (*Jepsonia malvifolia*)RPR 4.2
- Southern island mallow (*Lavatera assurgentiflora* ssp. *glabra*)RPR 1B.1
- Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)RPR 1B.2
- Pygmy leptosiphon (*Leptosiphon pygmaeus* ssp. *pygmaeus*)RPR 1B.2
- San Clemente Island woodland star (*Lithophragma maximum*)FE, SE, RPR 1B.1
- San Nicolas Island lomatium (*Lomatium insulare*)RPR 1B.2
- Guadalupe Island lupine (*Lupinus guadalupensis*)RPR 1B.2
- Santa Catalina Island desert-thorn (*Lycium brevipes* var. *hassei*)RPR 1B.1
- California box-thorn (*Lycium californicum*)RPR 4.2
- Santa Cruz Island ironwood (*Lyonothamnus floribundus* ssp. *aspleniifolius*)RPR 1B.2
- San Clemente Island bush-mallow (*Malacothamnus clementinus*)FE, SE, RPR 1B.1
- Leafy malacothrix (*Malacothrix foliosa* ssp. *foliosa*)RPR 4.2
- Dunedelion (*Malacothrix incana*)RPR 4.3
- Small-flowered microseris (*Microseris douglasii* ssp. *platycarpha*)RPR 4.2
- Island bush monkeyflower (*Mimulus flemingii*)RPR 4.3
- Blair's munzothamnus (*Munzothamnus blairii*)RPR 1B.2
- Mud nama (*Nama stenocarpum*)RPR 2.2
- Many-flowered phacelia (*Phacelia floribunda*)RPR 1B.2
- Island oak (*Quercus tomentella*)RPR 4.2
- Island redberry (*Rhamnus pirifolia*)RPR 4.2

- Santa Catalina figwort (*Scrophularia villosa*)RPR 1B.2
- Santa Cruz Island rock cress (*Sibara filifolia*)FE, RPR 1B.1
- Woolly seablite (*Suaeda taxifolia*)RPR 4.2
- Southern island clover (*Trifolium palmeri*)RPR 4.2
- San Clemente Island brodiaea (*Brodiaea kinkiensis*)RPR 1B.2
- California dissanthelium (*Dissanthelium californicum*)RPR 1B.2
- Vernal barley (*Hordeum intercedens*)RPR 3.2
- Appressed muhly (*Muhlenbergia appressa*)RPR 2.2
- San Clemente Island triteleia (*Triteleia clementina*)RPR 1B.2

The following special-status animal species are reported or are likely to be present on San Clemente Island based on habitat requirements and known range attributes:

- San Clemente Islandsnail (*Micrarionta gabbi*)~~CDFG~~CDFW Special Animals List
- San Clemente Island blunt-top snail (*Sterkia clementina*)~~CDFG~~CDFW Special Animals List
- Horseshoe snail (*Xerarionta intercisa*)~~CDFG~~CDFW Special Animals List
- Senile tiger beetle (*Cicindela senilis frosti*)~~CDFG~~CDFW Special Animals List
- Island night lizard (*Xantusia riversiana*)FT
- San Clemente sage sparrow (*Amphispiza belli clementeae*)FT, BCC, SSC, ABC
- Western snowy plover (*Charadrius alexandrinus nivosus*)FT, BCC, SSC, ABC, AWL, USBC
- San Clemente loggerhead shrike (*Lanius ludovicianus mearnsi*)FE, SSC
- Ashy storm-petrel (*Oceanodroma homochroa*)BCC, SSC, ABC
- Xantus' murrelet (*Synthliboramphus hypoleucus*)FC, BCC, ST, ABC
- San Clemente Island fox (*Urocyon littoralis clementae*)ST

Santa Catalina Island

Santa Catalina Island, part of the Channel Islands chain, is approximately 21 miles long and 8 miles wide. The Island consists of two parts connected by a low-lying isthmus at Two Harbors. The larger (southeastern) portion can be generally characterized by rolling hills with a gradual decent into the sea. The smaller (northwestern) portion is extremely steep and rugged with steep shoreline

palisades. Level terrain on the Island is limited to the floors of a few large coastal canyons and areas, such as Avalon, Pebbly Beach, White's Landing, Middle Ranch, Two Harbors, and Emerald Bay. Mount Orizaba, which is located in the central portion of the Island, represents the highest peak at 2,069 feet above mean sea level (MSL).

The climate of the Island is similar to the mainland with wet mild winters and long dry periods. The majority of the Island is relatively undisturbed, consisting of grasslands, coastal sage scrub, woodlands, and chaparral. Disturbed areas include minor camping areas, paved roads, dirt roads, radio tower pads, reservoirs and a landfill.

Because of habitation, proximity to Los Angeles, the work of the Catalina Island Conservancy, and the Wrigley Marine Science Center, the Island has been studied more than any of the other California offshore islands, with national, state, and County recognition in many ways. Nationally, all of the many offshore rocks and islets within 12 nautical miles of the coast are part of the California Coastal National Monument, which is managed by the Bureau of Land Management in the U.S. Department of the Interior. Of the 64 State-recognized sensitive plants, 3 are federally endangered and 1 is federally threatened. Two vertebrates have federal status: the federal candidate marine bird Xantus' murrelet (*Synthliboramphus hypoleucus*) and the federally-endangered Santa Catalina Island fox (*Urocyon littoralis catalinae*). The fox has recently recovered from an epidemic of distemper by a combination of the luck, in that the northwestern population was so isolated and hardly suffered, and by managed captive breeding.

The State Water Resources Control Board has named a number of areas as ASBS (Area of Special Biological Significance) for the water quality and the coincident diversity of the marine resources. These are the Northwest Santa Catalina Island ASBS #25 (20.9 miles of coastline from Isthmus Cove to Catalina Head), the Southeast Santa Catalina Island ASBS #28 (2.9 miles centered on Seal Rocks), the Western Santa Catalina ASBS #26 (4 miles of coastline from Little Harbor south to Ben Weston Beach), and the Farnsworth Bank ASBS #27 (37 acres on a submerged pinnacle, about 60 feet deep at the top, and covered with many kinds of encrusting organisms, such as the purple hydrocoral *Allopora californica*).

The State has also designated a number of State Marine Conservation Areas (SMCA) and three *de facto* State Marine Reserves (SMR) around the Island. In these conservation areas, the take method and what may be fished is limited very specifically and differs for each area. (1) Centered on Farnsworth Bank is the Farnsworth Offshore SMCA that extends from 1 to 3 nautical miles offshore and (2) the Farnsworth Onshore SMCA that extends from the coastline to meet the Farnsworth Offshore SMCA about 1 nautical mile. (3) All of CatHarbor on the south side of the Isthmus is in Cat Harbor SMCA with take restricted to recreational fishing for marine aquatic plants and finfish. (4) Arrow Point to Lion Head Point SMCA extends from mean high tide out to 1000 feet offshore. (5) Bird Rock SMCA is centered on Bird Rock off the northwest coast and extends from the offshore boundary of Blue Cavern SMCA to 3 nautical miles offshore, with boundaries drawn due N-S off the end points of Blue Cavern SMCA. (6) Blue Cavern SMCA is really a reserve, with no take allowed even of sport fish. (7) Long Point SMR has no take allowed, which is usual for reserves. (8) Casino Point SMCA on the north end of AvalonBay is really a reserve, with no take allowed. (9) Lover's Cove SMCA on the south side of Avalon Bay has common provisions, but includes the unusual one of the allowance of fish feeding (for the viewers on the glass-bottomed boats).

The California Department of ~~Fish and Game~~Fish and Wildlife maintains a list of sensitive species

(all rare and uncommon), which includes those designated federally. There are 64 plants, 5 snails, and 5 vertebrates listed for the Island.

California Audubon has designated the Island and its surrounding waters to about 0.8 miles offshore as part of the Northern Channel Islands Globally Important Bird Area (IBA).

The County requires special biological review of development on the Island if the project involves a parcel that has a designated Significant Ecological Area (SEA). These areas were all specified on the basis of significant island vegetation, and in a few cases, included marine algae. There are 37 designated SEAs on the Island: Arrow Point; Avalon Canyon; Toyon Canyon; Ben Weston Beach-Mills Landing-Sentinel Rock; Bird Rock; Black Point, Black Jack Mountain and Echo Lake; Blue Cavern Point-Fishermans Cove; Buffalo Springs Reservoirs; Bulrush Canyon; Cactus Peak; Cape Canyon; Cherry Valley; Cottonwood Canyon; Descanso Canyon; Fourth of July Cove; Gallagher Canyon; Geiger Coves; Haypress Area-Hamilton Canyon; Indian Rock; Isthmus; Isthmus Canyon; Johnsons Landing; Little Harbor-Shark Harbor-Indian Head Point; Middle Ranch Canyon; Mount Orizaba; Parsons Landing; Pebbly Beach Canyon; Renton Mine Road; Silver Peak; Skull Canyon; Sweetwater Canyon; White Cove; and Wild Boar Gully.

Vegetation

Vegetation on the Island is composed of a large variety of plant community types. The rugged topography, steep and rocky shoreline, and generally undisturbed condition of the Island has produced a unique diversity of vegetative communities. Historically, the Island was mostly brushland dominated by chamise (*Adenostoma fasciculatum*) and island ceanothus (*Ceanothus megacarpus* var. *insularis*) on the northern slopes, and California sagebrush (*Artemisia californica*) and Santa Catalina Island buckwheat (*Eriogonum giganteum* var. *giganteum*) on the south-facing slopes. Following the introduction of feral herbivores (goats, pigs, deer, and bison), this brushland was replaced in most areas by island scrub oak (*Quercus pacifica*), laurel sumac (*Malosma laurina*), toyon (*Heteromeles arbutifolia*), lemonadeberry (*Rhus integrifolia*), black sage (*Salvia mellifera*), and white sage (*S. apiana*), which dominate today. The lack of a significant fire history and minimal differences in vegetation along elevation gradients (due to an abundance of moisture) has resulted in slope orientation as a major determinant for species presence/absence.

Plant communities on the Island were classified using standard methodology and terminology. Most of the communities discussed correspond directly with those listed in Holland's Preliminary Descriptions of the Terrestrial Natural Communities of California(1986 and 1992 update). Other communities are named based on dominant species within them and/or commonly used terminology. Descriptions and general locations of each plant community on the Island, including maritime succulent scrub, southern coastal bluff scrub, island chaparral, island oak woodland, ironwood woodland, island cherry woodland, non-native grassland, native grassland, and disturbed are given below.

In recent years, ecologists have refined previous vegetation classification approaches to define communities primarily by their constituent plant assemblages, and have now widely adopted the classification system described by Sawyer, Keeler-Wolf and Evens in A Manual of California Vegetation, Second Edition 2009 (MCV). This has become the accepted standard recognized by the California Department of ~~Fish and Game~~Fish and Wildlife, the California Native Plant Society and the United States Fish and Wildlife Service.

The important difference between current and earlier methods is that earlier classifications were based on a variety of factors, such as physiographic features, as in the case of vernal pools;or by specific plants, as in the case of coast live oak woodland;or by the use of commonly accepted terms, as in chaparral. In the MCV, plant communities are defined with more precision as botanical alliances where one, or occasionally two, plant species are dominant or co-dominant with a host of other possible associated plants. The MCV lists no one plant community called chaparral because in habitats of this type any one of a variety of shrubs can be dominant and influence the character of the vegetation. For example, in a location where chamise (*Adenostoma fasciculatum*) is predominant it is classified as an *Adenostoma fasciculatum* Shrubland Alliance, while close by greenbark ceanothus (*Ceanothus spinosus*) may emerge as the most common shrub and this is termed a *Ceanothus spinosus* Shrubland Alliance.

The transition to the new MCV format is ongoing. Not all alliances have been fully described and new ones are still being recognized. As such, a significant amount of field work and site surveying for accuracy would be needed to verify all existing alliances on the Island, as well as extensive research to define every alliance in the new MCV plant communities' format. The more familiar nomenclatures will continue to be used for the Island when appropriate.

An effort has been made to conform to this new format. Descriptions and general locations of each plant community as described in the California Channel Islands Species Recovery Plan (USFWS, 1984) appear below. The plant communities correspond to classifications used in that document. Each was considered baseline information and evaluated for the potential presence of alliances as described in the MCV. Alliances with matching profiles of given criteria are listed. In many cases only with further investigation can the presence of some alliances be confirmed. In addition, it should be noted that not all alliances are listed within this description, as many alliances have yet to be defined and new alliances are still being discovered. Descriptions and general locations of the each plant community present on the Island are given below.

Maritime Succulent Scrub:A low, open scrub of soft-leaved shrubs and herbs with a rich admixture of stem and leaf succulents occurring on steep coastal slopes. This community is dominated by California sagebrush and coastal prickly-pear (*Opuntia littoralis*), which is located mainly on the exposed, dry south-facing slopes typically with well-drained soils. Other species associated with this community include Catalina crossosoma (*Crossosoma californica*), California brittle-bush (*Encelia californica*), Santa Catalina Island buckwheat, bedstraw (*Galium* spp.), island broom (*Acmispon dendroideus* var. *dendroideus*), laurel sumac, lemonadeberry, and black sage.

Corresponding MCV communities:

- *Artemisia californica* (California sagebrush scrub) Shrubland Alliance
- *Opuntia littoralis* (coast prickly pear scrub) Shrubland Alliance
- *Encelia californica* (California brittle bush scrub) Shrubland Alliance
- *Deinandra clementina-Eriogonum giganteum* (island buckwheat-island tar plant scrub) Provisional Shrubland Alliance
- *Malosma laurina* (laurel sumac scrub) Shrubland Alliance

- *Rhus integrifolia* (lemonade berry scrub) Shrubland Alliance
- Salvia mellifera (black sage scrub) Shrubland Alliance

Southern Coastal Bluff Scrub**:**A low scrub community adapted to exposed areas with nearly constant winds and high salt content. It consists of the largest reservoir of sensitive species and island endemics due to its location within inaccessible areas. This community is dominated by giant coreopsis (*Leptosyne gigantea*), Catalina crossosoma, *Dudleya*spp., Santa Catalina Island buckwheat, and island tarplant (*Deinandra clementina*)(David Carroll and Associates (DCA), 1994). Southern coastal bluff scrub, which occurs on the precipitous cliff, faces typically near the mouths of canyons and adjacent to some of the Island's disturbed areas on the steep seaward (east-facing) slopes and bluffs.

Corresponding MCV communities:

- *Leptosyne gigantea* (giant coreopsis scrub) Shrubland Alliance
- *Deinandra clementina-Eriogonum giganteum* (island buckwheat-island tar plant scrub) ProvisionalShrubland Alliance

Island Chaparral**:** Consists of tall broad-leafed shrubs that form a dense cover on steep slopes. Dominant species found within this community include island and MacDonald's scrub oaks(*Quercus pacifica* and *Q. macdonaldii*), feltleaf ceanothus (*Ceanothus arboreus*), chamise, island red berry, and Santa Catalina Island manzanita (*Arctostaphylos catalinae*). Island chaparral occupies canyon bottoms, most of the higher elevations, and steep, north-facing slopes.

Corresponding MCV communities:

- *Quercus pacifica* (island scrub oak chaparral)Shrubland Alliance
- *Ceanothus megacarpus* (big pod ceanothus chaparral)Shrubland Alliance
- *Adenostoma fasciculatum* (chamise chaparral)Shrubland Alliance

Island Oak Woodland: Dominated by canyon oak (*Quercus chrysolepis*)with a poorly developed shrub layer, which includes wild blackberry(*Rubus ursinus*), poison oak, heart-leaved penstemon(*Keckiella cordifolia*), and southern chaparral honeysuckle(*Lonicera subspicata* var. *denudata*). Some island oak woodlands along riparian habitat include scattered arroyo willows(*Salix lasiolepis*). This community occurs in relatively moist, protected canyon bottoms with rich alluvial soils.

Corresponding MCV communities:

- *Quercus chrysolepis* (canyon live oak forest)Forest Alliance

Island Ironwood Forest:An upland community characterized by a dominance of Catalina ironwood(*Lyonothamnus floribundus* ssp. *floribundus*).The Island endemic is a broad-leaved tree

and occurs in groves of 50-100 trees located along the north- and east-facing slopes (DCA 1994). Other species occasionally associated with the ironwood forest include island scrub oak and Santa Catalina Islandmanzanita. The understory is sparse, supporting a number of herbaceous annuals and ferns. This community is typically found in protected canyons with rich alluvial soils in the northern portion of theIsland.

Corresponding MCV communities:

- *Lyonothamnus floribundus* (Catalina ironwood groves)Woodland Special Stands

Island Cherry Woodland:An open, dense woodland dominated by Catalina cherry (*Prunus ilicifolia* ssp. *lyonii*)with an understory consisting of Santa Catalina figwort(*Scrophularia villosa*), cudweed(*Gnaphalium* spp.), common chickweed(*Cerastium glomeratum*), wild cucumber(*Marah macrocarpa*), Santa Catalina Island bushmallow(*Malacothamnus fasciculatus* var. *catalinensis*), island morning-glory(*Calystegia macrostegia* ssp. *amplissima*), and many of weedy forb and grass species. This community occurs mostly along riparian habitats and in valley/canyon bottoms in the northern portion of the Island.

Corresponding MCV communities:

- *Prunus ilicifolia* (Holly leaf cherry chaparral)Shrubland Alliance

Grassland: Consist of low, herbaceous vegetation that are dominated by grasses, but generally also harbor native forbs and bulbs as well as naturalized annual forbs. Non-native grassland consists of dominant invasive annual grasses that are primarily of Mediterranean origin. Dominant species found within this community include slender oats(*Avena barbata*), wild oats(*A. fatua*), ripgut brome(*Bromus diandrus*), red brome (*B. madritensis* ssp. *rubens*), and wild mustards (*Brassica*, *Hirschfeldia*, and *Sisymbrium* spp.). Non-native grasslands are located in small patches throughout the Island; along many of the ridges and gentle slopes with shallow clay or clay loam substrates;and in more significant acreage, on rolling hills in the southeastern portion of the Island.Native grassland consists of at least 10 percent cover of native grass species with the remaining coverage similar to non-native grasslands. Small patches of native grassland can be found on the Island mostly mixed with non-native grasslands.

Corresponding MCV communities:

- *Avena* (*barbata*, *fatua*)(Wild oats grasslands)Semi-NaturalHerbaceous Stands
- *Bromus* (*diandrus*, *hordeaceus*)-*Brachypodium distachyon* (Annual brome grasslands)Semi-NaturalHerbaceous Stands
- *Bromus rubens-Schismus* (*arabicus*, *barbatus*)(Red brome or Mediterranean grass grasslands)Semi-NaturalHerbaceous Stands
- *Brassica nigra* and other mustards (Upland mustards)Semi-NaturalHerbaceous Stands

Disturbed Areas: Areas that either completely lack vegetation or are dominated by ruderal species within developed areas. Vegetation typically include horehound (*Marrubium vulgare*)and tree tobacco(*Nicotiana glauca*). Several disturbed areas occur throughout the Island and take the form of

residential developments, paved roads, fire breaks, dirt access roads, trails, and other similarly disturbed areas.

Corresponding MCV communities: None at this time.

Wildlife

Wildlife on the Island is diverse and abundant due to the large acreage of natural open space and the diversity of habitat types. While a few wildlife species are entirely dependent on a single vegetative community, the vegetation communities within the area and adjoining areas constitute a functional ecosystem for a variety of wildlife species.

The analysis of invertebrates is severely limited due to the lack of data. The Island, however, supports healthy populations of a diverse assortment of countless invertebrate species. Amphibian populations are generally abundant and diverse due to the high moisture content provided under the shade of woodlands and the abundance of drainages. Many essential reptilian habitat characteristics are present. These include open habitats that allow free movement and high visibility and small mammal burrows for cover and escape from predators and extreme weather. These characteristics as well as the variety of habitat types present are likely to support a wide variety of reptilian species.

The scrubland, woodland, riparian, and grassland habitats provide foraging and cover habitat for year-round residents, seasonal residents, and migrating song birds. In addition, several year-round water sources and abundant raptor foraging, perching, and nesting habitat are located throughout the area. The combination of these resources as well as the confluence of many community types provides for a high diversity of bird species. Unlike other taxonomic groups, mammal populations are diverse and reflective of the unique island habitat types.

Wildlife Movement

Wildlife movement occurs throughout the Island. Concentrated movement corridors or bottlenecks are uncommon on the Island due to the abundance of uninterrupted open space and the lack of disturbed areas. In general, movement takes place in large drainages, along ridgelines, and along dirt roads. However, the small isthmus at Two Harbors represents a significant reduction in the ability for animals to move freely between the two parts of the Island. Movement across the isthmus has been further restricted by human encroachment of the Two Harbors community and Island visitors. Although a lack of movement across the isthmus may isolate some animal populations and reduce the genetic diversity on either side, this division has provided a unique opportunity for restoration by isolating and removing feral animals from the Island.

Sensitive Biological Resources

The statuses of rare plants are hierarchically categorized by the CNPS using a rank and decimal system. The initial category level of Rare Plant Rank is indicated by ranks 1A (presumed extinct in California), 1B (rare or endangered in Californiaand elsewhere), 2 (rare or endangered in California but more common elsewhere), 3 (more information needed, a review list), and 4 (limited distribution). In cases where the CNPS has further identified the specific threat to the species, a decimal or Threat Code is added:.1 (seriously endangered in California), .2 (fairly endangered in California)or .3 (not very endangered in California).

The following special-status plant taxa have been reported or have the potential to occur on Santa Catalina Island, based on known habitat requirements and geographic range information:

- Baja rock lichen (*Graphis saxorum*)~~CDFG~~CDFW Special Plants List
- Red sand-verbena (*Abronia maritima*)RPR 4.2
- Island broom (*Acmispon dendroideus* var. *dendroideus*)RPR 4.2
- Aphanisma (*Aphanisma blitoides*)RPR 1B.1
- Santa Catalina Island manzanita (*Arctostaphylos catalinae*)RPR 1B.2
- Coulter's saltbush (*Atriplex coulteri*)RPR 1B.2
- South Coast saltscale (*Atriplex pacifica*)RPR 1B.2
- Davidson's saltscale (*Atriplex serenana* var. *davidsonii*)RPR 1B.2
- Golden-spined cereus (*Bergerocactus emoryi*)RPR 2.2
- Round-leaved filaree (*California macrophylla*)RPR 1B.1
- Island ceanothus (*Ceanothus megacarpus* var. *insularis*)RPR 4.3
- Southern tarplant (*Centromadia parryi* ssp. *australis*)RPR 1B.1
- Island mountain-mahogany (*Cercocarpus betuloides* var. *blancheae*)RPR 4.3
- Catalina Island mountain-mahogany (*Cercocarpus traskiae*)FE, SE, RPR 1B.1
- Seaside cistanthe (*Cistanthe maritima*)RPR 4.2
- Nevin's woolly sunflower (*Constancea nevinii*)RPR 1B.3
- Small-flowered morning-glory (*Convolvulus simulans*)RPR 4.2
- Catalina crossosoma (*Crossosoma californicum*)RPR 1B.2
- Island tarplant (*Deinandra clementina*)RPR 4.3
- South island bush-poppy (*Dendromecon harfordii* var. *rhamnoides*)RPR 1B.1
- Western dichondra (*Dichondra occidentalis*)RPR 4.2
- Beach spectaclepod (*Dithyrea maritima*)ST, 1B.1
- Greene's dudleya (*Dudleya greenei*)RPR 4.2
- Catalina Island dudleya (*Dudleya virens* ssp. *hassei*)RPR 1B.2

- Island green dudleya (*Dudleya virens* ssp. *insularis*)RPR 1B.2
- Bright green dudleya (*Dudleya virens* ssp. *virens*)RPR 1B.2
- Santa Catalina Island buckwheat (*Eriogonum giganteum* var. *giganteum*)RPR 4.3
- Island buckwheat (*Eriogonum grande* var. *grande*)RPR 4.2
- Island poppy (*Eschscholzia ramosa*)RPR 4.3
- Cliff spurge (*Euphorbia misera*)RPR 2.2
- Santa Catalina Island bedstraw (*Galium catalinense* ssp. *catalinense*)RPR 1B.2
- Nuttall's island bedstraw (*Galium nuttallii* ssp. *insulare*)RPR 4.3
- Showy island snapdragon (*Gambelia speciosa*)RPR 1B.2
- Nevin's gilia (*Gilia nevinii*)RPR 4.3
- Palmer's grapplinghook (*Harpagonella palmeri*)RPR 4.2
- Island rush-rose (*Helianthemum greenei*)FT, RPR 1B.2
- Decumbent goldenbush (*Isocoma menziesii* var. *decumbens*)RPR 1B.2
- Island jepsonia (*Jepsonia malvifolia*)RPR 4.2
- Southern island mallow (*Lavatera assurgentiflora* ssp. *glabra*)RPR 1B.1
- Fragrant pitcher sage (*Lepechinia fragrans*)RPR 4.2
- Santa Barbara honeysuckle (*Lonicera subspicata* var. *subspicata*)RPR 1B.2
- Santa Catalina Island desert-thorn (*Lycium brevipes* var. *hassei*)RPR 1B.1
- California box-thorn (*Lycium californicum*)RPR 4.2
- Santa Catalina Island ironwood (*Lyonothamnus floribundus* ssp. *floribundus*)RPR 1B.2
- Small-flowered microseris (*Microseris douglasii* ssp. *platycarpha*)RPR 4.2
- Santa Catalina Island monkeyflower (*Mimulus traskiae*)RPR 1A
- Coast woolly-heads (*Nemacaulis denudata* var. *denudata*)RPR 1B.2
- Short-lobed broomrape (*Orobanche parishii* ssp. *brachyloba*)RPR 4.2
- Lyon's pentachaeta (*Pentachaeta lyonii*)FE, SE, RPR 1B.1

- Engelmann oak (*Quercus engelmannii*)RPR 4.2
- Island scrub oak (*Quercus pacifica*)RPR 4.2
- Island oak (*Quercus tomentella*)RPR 4.2
- Island redberry (*Rhamnus pirifolia*)RPR 4.2
- Santa Catalina Island currant (*Ribes viburnifolium*)RPR 1B.2
- Santa Catalina figwort (*Scrophularia villosa*)RPR 1B.2
- Chaparral ragwort (*Senecio aphanactis*)RPR 2.2
- Santa Cruz Island rock cress (*Sibara filifolia*)FE, RPR 1B.1
- Wallace's nightshade (*Solanum wallacei*)RPR 1B.1
- Woolly seablite (*Suaeda taxifolia*)RPR 4.2
- Southern island clover (*Trifolium palmeri*)RPR 4.2
- Catalina mariposa lily (*Calochortus catalinae*)RPR 4.2
- California dissanthelium (*Dissanthelium californicum*)RPR 1B.2
- Vernal barley (*Hordeum intercedens*)RPR 3.2
- Chaparral rein orchid (*Piperia cooperi*)RPR 4.2

The following special-status animal species are reported or are likely to be present on Santa Catalina Island based on habitat requirements and known range attributes:

- Santa Catalina lancetooth (*Haplotrema catalinense*)~~CDFG~~CDFW Special Animals List
- Shepard's snail (*Pristiloma shepardae*)~~CDFG~~CDFW Special Animals List
- Catalina mountainsnail (*Radiocentrum avalonense*)~~CDFG~~CDFW Special Animals List
- San Clemente Island blunt-top snail (*Sterkia clementina*)~~CDFG~~CDFW Special Animals List
- Sandy beach tiger beetle (*Cicindela hirticollis gravida*)~~CDFG~~CDFW Special Animals List
- Santa Catalina garter snake (*Thamnophis hammondii* ssp.)~~CDFG~~CDFW Special Animals List
- Bald eagle (*Haliaeetus leucocephalus*)SE, CDF, ~~CDFG~~CDFW Fully Protected
- Xantus' murrelet (*Synthliboramphus hypoleucus*)FC, BCC, ST, ABC
- Santa Catalina Island shrew (*Sorex ornatus willetti*)SSC

- Santa Catalina Island fox (*Urocyon littoralis catalinae*)FE, ST

Santa Monica Mountains

For a description of the resources in the Santa Monica Mountains, please refer to the description for the Santa Monica Mountains Significant Ecological Area (SEA) in Section IV.

VI. Watersheds

Antelope ValleyWatershed

The southern half of the Lahontan hydrologic region is located in the Antelope Valley. Unlike the coastal watersheds in Los AngelesCounty, it is a closed basin onthe edge of the Mojave Desert,having no outlet to the ocean or major river system. Numerous streams drain the north-facing San Gabriel Mountains, carrying rainfall and snow melt from the Angeles National Forest into the Antelope Valley. Significant stream systems in the Antelope Valley are Amaroosa Creek, Big Rock Creek, and Little Rock Creek.

During most years, the rainfall in the Antelope Valley is scant, averaging less than eightinches per year. Every few years, major storms cause flooding, sending sheets of water flow across the eastern portion of the Antelope Valley to the dry lakebeds of Rosamond and Rodgers lakes in Kern County. Uninhibited by development, the sheet flow filters into the groundwater basin or evaporates on the lakebeds, leaving the surface smooth and flat. This natural runoff process is important for two reasons: 1) it benefits the local communities with groundwater recharge; and 2) it seasonally resurfaces the dry lake beds, which are used for aircraft landings at Edwards Air Force Base.

The Lahontan Regional Water Quality Control Board monitors the Antelope Valley watershed through its Basin Plan for the region. The Basin Plan calls for land use controls to help reduce pollutants in stormwater runoff. In particular, the Basin Plan advocates for limiting impervious surfaces, restoring natural vegetation and protecting the headwaters of stream channels and riparian areas.

Los Angeles River Watershed

The Los Angeles River watershed covers approximately 870 square miles, a small part of which extends into Ventura County. It includes the San Fernando Valley and is the largest watershed in the Los Angeles Basin. The river extends 51 stream miles, from the confluence of Bell Creek and Arroyo Calabasas, to the Pacific Ocean. The first 32 miles of the river flow through the cities of Los Angeles, Burbank, and Glendale, and then, subsequently, through Vernon, Commerce, Maywood, Bell, Bell Gardens, Lynwood, Compton, South Gate, Paramount, Cudahy, and Long Beach. Numerous tributaries feed the Los Angeles River, as it flows through the San Fernando Valley and the coastal plain to the Long Beach Harbor. These tributaries include Tujunga Wash, Verdugo Wash, Arroyo Seco, Rio Hondo, and Compton Creek. Several important biotic communities exist in the northern tributaries that feed the river, including freshwater marsh areas in Tujunga Canyon and the Hansen Flood Control Basin. The natural habitat in these tributaries provides a semi-protected corridor for wildlife between the Angeles National Forest, Santa Monica Mountains National Area, and the Los Angeles River.

By 1960, the Los Angeles River was lined with concrete along most of its length by the U.S. Army Corps of Engineers in order to prevent the loss of lives and property from flood damage. As a result, the Los Angeles River's sole purpose for years was efficient water conveyance—carrying stormwater from the land to the ocean as quickly as possible. Efforts continue under the auspices of the Los Angeles County Flood Control District to capture as much stormwater as possible and redirect it to regional groundwater recharge areas to replenish groundwater basins, saving thousands of acre-feet of water every year.

The volume of pollutants that enters the Los Angeles River is extremely high due to accumulated urban stormwater runoff from the hundreds of square miles of impervious land uses that flank the Los AngelesRiver. To address these problems, the County, the Flood Control District, local jurisdictions, a variety of stakeholders, and the Los Angeles Regional Water Quality Control Board are implementing programs to reduce the number and concentration of pollutants that enter the Los Angeles River.

Over the past two decades, interest the Los Angeles River's recreational and ecological functions has reemerged, culminating in a riverwide planning effort in the 1990s, which resulted in the adoption of the *Los Angeles River Master Plan* by the Board of Supervisors in 1996. The Plan was created through a cooperative effort by the County and many river stakeholder groups for the enhancement of aesthetic, recreational, flood protection and environmental functions of the Los Angeles River. The Plan seeks to do so by expanding bikeway, walking and equestrian trails to and along the Los Angeles River, enhancing existing trails and habitat with landscaping, and promoting economic development opportunities. Since the adoption of the Plan, an advisory committee has overseen many new projects, including bike trails, pocket parks, equestrian trail enhancements, art and signage. So much public interest in the river has been generated that many more improvements are anticipated in the future. The County's Bicycle Master Plan also prioritizes the Los Angeles River bike path.

The County is also working with various organizations and agencies that are involved in watershed-related planning activities, such as the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy, the Council for Watershed Health, and the Flood Control District. The attention being paid to the watershed has resulted in a better understanding of its functions and generated an unprecedented network of residents, private organizations and government entities dedicated to watershed management. The County has also partnered with the City of Los Angeles on implementation of its 2007 Los Angeles River Revitalization Master Plan.Subsequently, the County Board of Supervisors and Los Angeles City Council adopted the Los Angeles River Memorandum of Understanding, which established theLos Angeles River Cooperation Committee to prioritize cooperative implementation of Los Angeles River projects. In addition, the County is a partner in the U.S. Army Corps of Engineers' Los Angeles River Ecosystem Restoration Feasibility Study (started in 2006 for which the City of Los Angeles is serving as primary local sponsor). The County is also a partner with the U.S. Bureau of Reclamation on the Los Angeles Basin Study to prioritize stormwater capture and infiltration that will result in watershed-wide conservation.

Compton Creek Sub-Watershed

Compton Creek drains an area of approximately 42 square miles, including portions of the cities of Carson, Compton, Long Beach, Los Angeles, Lynwood, and South Gate and portions of the unincorporated communities of Florence-Firestone, Willowbrook, and Rancho Dominguez. Compton

Creek drains into the Los Angeles River, which then empties into San Pedro Bay at the eastern edge of Long Beach Harbor.

With more than 700,000 residents, the Compton Creek watershed is highly urbanized and most of its drainage courses are lined with concrete. Approximately 97 percent of the land area is occupied by homes, businesses, roads, and similar uses. As a result of excess levels of trash and coliform bacteria, surface and groundwater quality in Compton Creek has been degraded, natural hydrologic functions modified, and plant and wildlife diversity reduced.

In recent years, various groups, cities, and agencies have worked to transform Compton Creek into a valued community asset, improve and expand open space, optimize water resources, preserve and restore habitat, and create a network of trails and bike paths. Some of these efforts have been informally coordinated, in recognition of the potential to extend benefits beyond the borders of individual cities, create opportunities to leverage benefits, and maximize funding resources.

Los Angeles Harbor Watershed

The major river system within the area that drains to Los Angeles Harbor is the Dominguez Channel.The Dominguez Channel watershed, part of the larger Los Angeles Harbor watershed, is located within the southern portion of Los Angeles County and encompasses approximately 110 square miles of intensely urban area. Approximately 81 percent of the watershed is developed. Residential development covers nearly 40 percent of the watershed, and another 41 percent is made up by industrial, commercial and transportation uses. With a population of nearly 1 million, considerable demands are made on infrastructure and services within the watershed. Local water supply is limited and the majority of water use is provided by imported sources. Parkland and open space are in short supply and generally are deficient. Another significant stream system within the Los Angeles Harbor watershed is the Wilmington Drain.

There are significant stormwater pollution issues in this watershed. For example, old waste disposal practices have left DDT and PCBs deposited in the channel bottom, which are carried to the harbor in land and aquatic sediment swept up and re-suspended by stormwater.

Nine unincorporated areas are located within this urban-industrial watershed and each of these areas affects and is affected by the health and function of Dominguez Channel and its tributaries.

San Gabriel River Watershed

The San Gabriel River watershed encompasses part of the Angeles National Forest, the San Gabriel Valley, and large urban areas in southeast portion of Los AngelesCounty. It is bounded by the Los Angeles River on much of its western flank, and extends to San Bernardino and Orange counties. Totaling more than 640 square miles, the watershed has extensive areas of un-channeled tributaries, which support riparian and woodland habitats. Its northern reaches in the Angeles National Forest are dramatically different from the developed 167 square miles in the Los Angeles Basin. The U.S. Congress has preserved two wilderness areas within this watershed: the San Gabriel Wilderness Area, 36,215 acresalong the west fork of the San Gabriel River, and Sheep Mountain Wilderness Area, 31,680 acres along the east fork of the San Gabriel River.

The main watercourse in this watershed is the San Gabriel River. The San Gabriel River extends 59 stream miles from the Angeles National Forest to the Pacific Ocean, draining 350 square miles of

land. It also recharges groundwater tables in several basins. The major tributaries that feed the San Gabriel River include Coyote Creek, Walnut Creek, Puente Creek and San Jose Creek. The upper section of the San Gabriel River and its tributaries are still considered relatively pristine. However, intensive recreational use and erosion due to wildfires in this area may threaten water quality and wildlife that depend on the river. The middle section of the river has been extensively modified throughout the San Gabriel Valley to diminishflood damage and encourage groundwater recharge. The lower section, similar to the Los Angeles River, is lined with concrete from Firestone Boulevard to the bay. In contrast to the upper and middle sections of the river, dry weatherflow in the lower section stems primarily from urban runoff and treated effluent from municipal wastewater treatment facilities.

A clear link exists between the health of this watershed and the quality of life for millions of Los Angeles County residents. The upper reaches of the San Gabriel River support wildlife, deliver drinking water and provide a myriad of recreational opportunities. To protect and enhance the multiple benefits of this resource a riverwide planning effort entitled *San Gabriel River Master Plan* was adopted in 2006. This effort, spearheaded by the County, brings together a dynamic group of stakeholders, including the 13 cities along the San Gabriel River, residents, environmental groups and many business and community leaders.

The County is working with stakeholders, such as the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy, the Santa Monica Mountains Conservancy, and the Flood Control District. Together, stakeholders developed a watershed and open space plan in 2001 entitled *Common Ground: From the Mountains to the Sea* that provides general guidelines for improvement of the San Gabriel and Lower Los Angeles Rivers watersheds through community development, public awareness, preservation of open space and creation of recreational opportunities—particularly along the rivers.

Santa Clara River Watershed

The Santa Clara River watershed is an extensive hydrologic system that encompasses the western portion of the Angeles National Forest in Los Angeles County and the eastern portion of Los Padres National Forest in Ventura County. The Santa Clara River—an essential component of this watershed—recharges local groundwater, provides riparian habitat and supplies water to downstream agricultural lands in Ventura County. It is the largest relatively unaltered river system in Southern California, and the single most important natural wildlife corridor in Los Angeles County. The Santa Clara River and its tributaries provide drainage for approximately 654 square miles of the upper watershed within Los Angeles County. The Santa Clara River's major tributaries include Soledad Canyon, Castaic Creek, San Francisquito Canyon Creek, Bouquet Canyon Creek, Sand Canyon Creek, Mint Canyon Creek and Santa Clara River South Fork. Several endangered species are found in this watershed, including thearroyo toad and the unarmored three-spine stickleback. Another important stretch of the Santa Clara River supports a variety of riparian-obligate songbirds and birds of prey between Castaic Junction and Blue Cut near the Ventura County line, where the groundwater basin thins and narrows, forcing groundwater toward the surface.

A link exists between the health of this watershed, particularly its tributaries, and development in the area. Urban expansion in the 1990s and early 2000s impacted the watershed on several levels, including a reduction in local water supplies and disappearing open space. Furthermore, the land use activities in this area have created many square miles of impervious surfaces, which have

created more urban runoff and reduced the amount of water that would naturally percolate into groundwater basins. By employing watershed management techniques, the County aims to curb this trend.

Santa Monica BayCoastal Watersheds

The County, other agencies, cities, and stakeholders coordinate the management of the coastal watersheds of Santa Monica Bay as two distinct management areas, due to the vast differences in land use and population density: North Santa Monica Bay watersheds (North Bay) and the South Santa Monica Bay watersheds (South Bay). The North Bay consists of the Malibu Creek and Topanga Creek watersheds as well as sixteen other rural coastal watersheds. North Bay watersheds are primarily natural open space with low-density residential developments. The South Bay includes Ballona Creek watershed, Marina Del Rey, and 10 urban coastal sub-watersheds.Although vastly different from one another, these watersheds have a direct impact on the quality and quantity of water delivered to the Santa Monica Bay. The Malibu Creek watershed traverses a rural mountainous area, while the Ballona Creek watershed is comprised of intensely urban development.

The coastal watersheds of the Santa Monica Bay extend from the Ventura County-Los Angeles County line to outer Cabrillo Beach in San Pedro. This length includes 44 beaches along 55 miles of coastline, attracting over 55 million beach visitors each year. While the Malibu Creek and Ballona Creek watersheds also drain to Santa Monica Bay, they are typically managed as separate areas due to their significant size.

Ballona Creek Sub-Watershed

The Ballona Creek watershed is located in the western portion of Los Angeles County and is approximately 130 square miles in size. It is highly urbanized and home to more than 1.6 million residents. It includes the cities of Beverly Hills and West Hollywood; portions of the cities of Culver City, Inglewood, Los Angeles, Santa Monica; Caltrans facilities; the Ballona Wetlands, and the unincorporated communities of Marina Del Rey, Baldwin Hills, Ladera Heights and a portion of Playa Del Rey. Centinela Creek, Sepulveda Canyon Channel and Benedict Canyon Channel are significant tributaries of Ballona Creek.

Over the years, the urbanization of the Ballona Creek watershed routed many small tributaries through storm drains. These storm drains collect runoff from city streets and carry it to major tributaries and eventually to Ballona Creek, which flows into the Santa Monica Bay. Major contributors to the impaired water quality in Ballona Creek are urban runoff and illegal dumping. These pollutants significantly contribute to pollution in the Santa Monica Bay, degrading ecosystems and recreational opportunities.

The Ballona Creek Trash TMDL became effective on August 11, 2005. To comply with this regulation, the County adopted an aggressive strategy to reduce the amount of trash entering Ballona Creek from unincorporated areas.

Malibu Creek Sub-Watershed

Malibu Creek watershed is the largest rural watershed in North Santa Monica Bay. It is approximately 109 square miles and consists of over 75 percent natural open space. The Malibu Creek watershed encompasses a major portion of the Santa Monica Mountains and is one of many

sub-watersheds that drain the mountain range. Over the past twenty years, the number of residents living in the Malibu Creek watershed has doubled. This growth and development has increased runoff, sedimentation and demand for imported water, and caused various tributaries that feed Malibu Creek to be channelized. As a result, the natural flow of water within the watershed has changed, degrading oak and riparian woodlands, steelhead trout populations, and the Malibu Lagoon.

The primary watercourse draining this watershed is Malibu Creek, which flows into Malibu Lagoon. The health and function of Malibu Creek and its tributaries is an important issue as these waterways drain 109 square miles of the watershed into Malibu Lagoon and the Santa Monica Bay—a National Estuary.[12] Two important plant communities comprise the lagoon: the coastal salt marsh and coastal strand, and over 200 species of birds use the lagoon as a refuge.

A clear link exists between the health of Malibu Creek watershed, particularly Malibu Creek, and development in the mountains. Land use activities account for about half of all pollutants that enter the Malibu watershed drainage. Pollution sources include roadway runoff, septic system overflow, new construction, and vegetation clearance.

The Santa Monica Mountains North Area Plan, adopted by the Board of Supervisors in 2000, and the 1986 Local Coastal Plan address the adverse affect of development on the Santa Monica Mountains. These plans, which cover portions of the mountains north of the coastal zone, significantly restrict the potential number of dwelling units that may be built in the mountains. The guiding principle of the plan is to let the land dictate the site and type of development that should be allowed.

Marina Del Rey Sub-Watershed

The Marina Del Rey watershed is approximately twosquare miles in size and its drainage area is mostly within the City of Los Angeles. The unincorporated marina and harbor were mainly constructed from remnants of the Ballona Creek Wetlands and Estuary.

VII. Agricultural Resources

Agricultural Resource Areas Methodology

Figure 6.5in the Conservation and Natural Resources Element shows the County's Agricultural Resource Areas(ARAs), where the County promotes the preservation of agricultural activities. The ARA boundaries were derived from farmland identified by the State Department of Conservation, including Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland. In addition, the ARAs include lands that received permits from the Los Angeles County Agricultural Commissioner/Weights and Measures.

[12] The Santa Monica Bay is designated a National estuary under the U.S. EPA's National Estuaries Program.

To reflect changes in land uses and address environmental concerns, the following were excluded from the ARAs:

- Significant Ecological Areas (SEA) and Ecological Transition Areas (ETA);
- Approved specific plan areas;
- Approved large-scale renewable energy facilities;
- Lands outside of the Santa Clarita and Antelope Valleys, where farming is concentrated; and
- Lands that are designated Public and Semi-Public (P).

Data from the U.S. Census of Agriculture

Table E.1: Change in Number and Acreage of Farms in Los Angeles County, 1987-2007

	1987	**1992**	**1997**	**2002**	**2007**
Farms (number)	2,035	1,446	1,226	1,543	1,734
Change from previous year	-	-589	-220	317	191
Percent change from previous year	-	-28.94%	-15.21%	25.86%	12.38%
Land in farms (acres)	280,156	183,569	130,838	111,458	108,463
Change from previous year	-	-96,587	-52,731	-19,380	-2,995
Percent change from previous year	-	-34.48%	-28.73%	-14.81%	-2.69%

Source: U.S. Census of Agriculture, 1987-2007.