**5. 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 substrate that retain 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 spread from pool to pool is carried in mud, which adhere 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, which extends 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 Compendium of the Los 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. Less frequently 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

<u>Non-Native Grassland</u>: 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 holly leaf 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* (holly leaf 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 sizes, which usually results from habitat loss. Watch lists of such resources are maintained by the California Department of Fish and Game (CDFG), 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 (CDFG) 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, 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 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 Watch List
Two-striped garter snake (*Thamnophis hammondii*) BLMS, SSC, FSS
Bell's sage sparrow (*Amphispiza belli belli*) ABC, CDFG Watch List, BCC
Golden eagle (*Aquila chrysaetos)* CDF, CDFG Fully Protected, CDFG Watch List, BCC
Burrowing owl (*Athene cunicularia*) BLMS, SSC, BCC
Northern harrier (*Circus cyaneus*) SSC
Prairie falcon (*Falco mexicanus*) CDFG 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

***Ecological Transition Areas (ETAs)***

There are no ETAs designated within this SEA.

***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 | 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 |

| Criterion | | Status | Justification |
|---|---|---|---|
| | are either unique or are restricted in distribution. | | 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.

**5. Cruzan Mesa Vernal Pools SEA Sources**

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